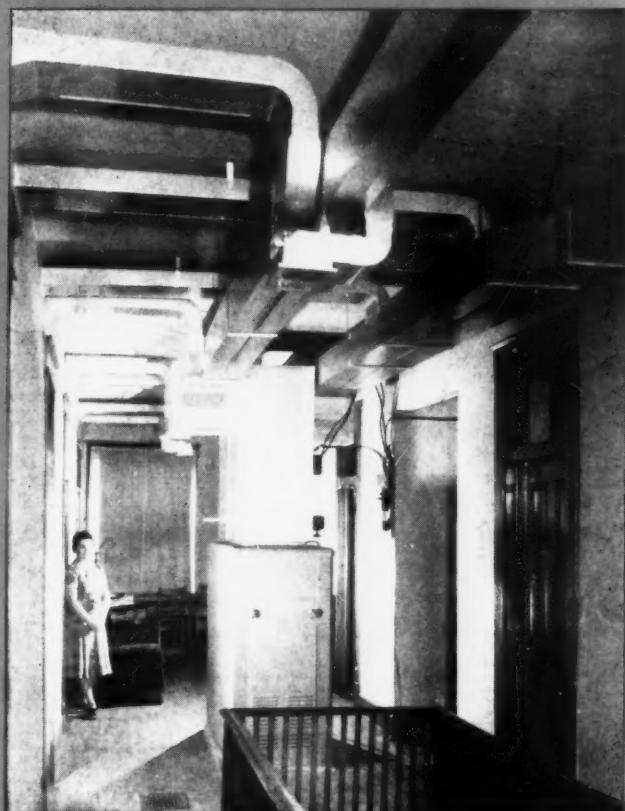


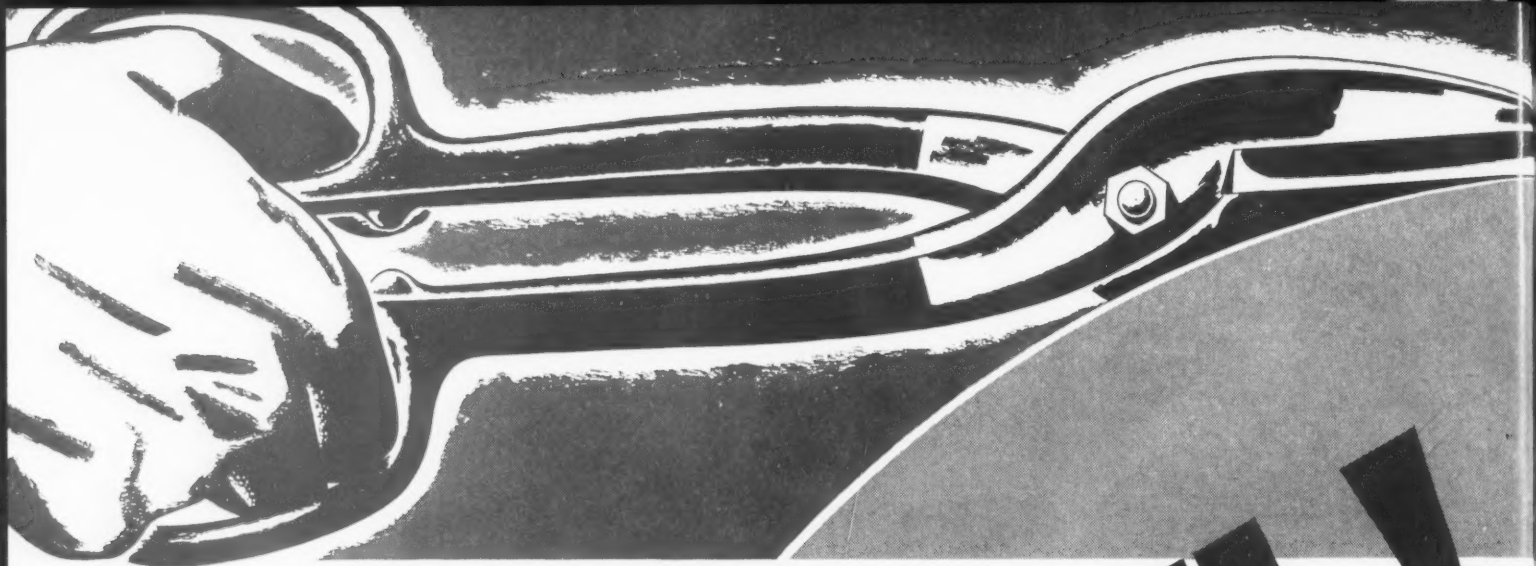
AMERICAN ARTISAN

FEBRUARY
1942



RESIDENTIAL AIR CONDITIONING
WARM AIR HEATING • SHEET METAL CONTRACTING

ESTABLISHED
1888



CUTS WASTE!

Lamneck Prefabricated Duct and Fittings Cut Waste for Sheet Metal Contractors

Elimination of all waste in governmental and private effort is most important during this period of our emergency. Nation-wide Governmental regulation guarding against waste of materials—of time—of machine power—and of man power—benefits all. Lamneck service is primarily one that cuts waste wherever furnace pipe and fittings and duct and fittings are required. You can specify Lamneck Prefabricated Duct and Fittings and automatically eliminate waste, reduce man-hours, shop work, scrap piles, misfits. Write today for the name of your nearest Lamneck jobber and learn more about Lamneck Service.

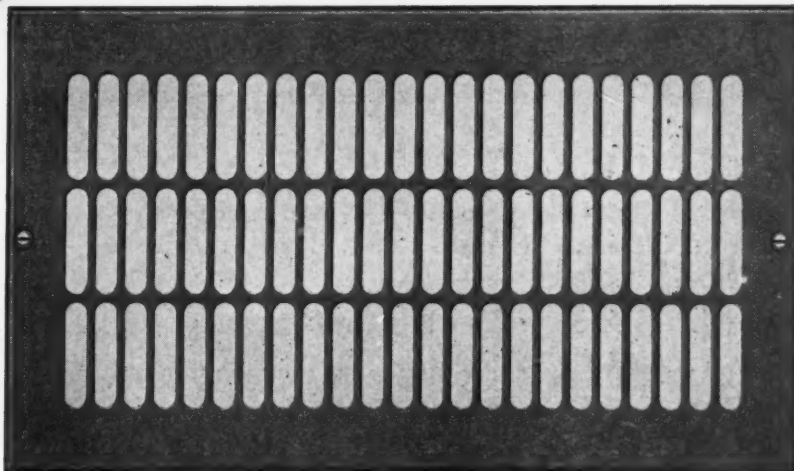


LAMNECK PRODUCTS INC. Middletown, Ohio

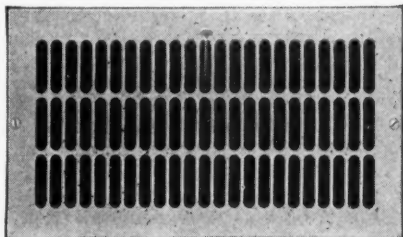
Simplified Furnace Pipe and Fittings and Prefabricated Duct and Fittings for all Types



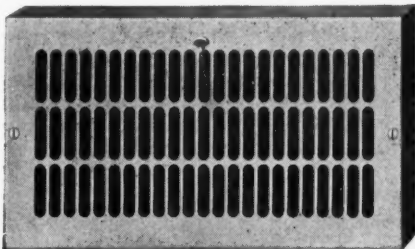
FOR \$6000 HOUSES - USE CLASSIC "6000" REGISTERS!



No. 6005
Classic Intake



No. 6032 Classic Wall Register



No. 6042 Classic Baseboard Register

Auer originated the Classic face, and although hundreds of thousands have been used, it has never outlived its popularity. It is a fine, attractive register of moderate cost. It has "clicked" with the trade because of its pleasing grille design. It is truly a beautiful register.

Another beauty of the Classic is that it's so adaptable to various purposes and grades of work. It can be furnished with single louvre for low cost warm air jobs—or, for air conditioning, with multi-louvres, either vertical or horizontal blades for any desired diffusion. For "\$6000 Houses" the Auer Classic "6000" Line of registers and grilles is especially suitable from the standpoint of cost, of appearance, of service value.

Auer makes a complete line of registers and grilles, in many designs, including all types of directional flow registers, for warm air or air conditioning. Ask for new Auer Register Book—or for your grille requirements, special Grille Catalog "G."

THE AUER REGISTER CO., 3608 Payne Avenue, Cleveland, Ohio

AUER REGISTERS

& GRILLES · For Air Conditioning *and* Gravity

AMERICAN ARTISAN

Covering All Activities in Residential Air Conditioning and Small Commercial Cooling, Warm Air Heating, Sheet Metal Contracting and Fabricating

WITH WHICH ARE MERGED

**FURNACES
and
SHEET METALS**

AND

**Warm-Air
Heating**

J. D. Wilder, Editor

A. A. Kennedy, Assistant Editor

Vol. 111, No. 2 February, 1942 Founded 1880

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In This Issue

MORE and more, as the weeks roll up, news from Washington becomes increasingly vital to the intelligent pursuance of each man's business. Like it or not, we are now so involved in the web of orders, schedules, regulations, interpretations, agencies—that we cannot conduct our business without some fair appreciation of what we are expected or asked or required to do.

And so, as time goes on, more and more space will have to be given over to news of this new partner in your business and ours—Government.



Such news—in the form of unbiased, uncolored reports of these regulations and interpretations thereof—we consider a part of the service readers expect from their business paper. To the best of our ability we will supply this news.

Readers can help greatly by sending us their particular questions. We cannot guarantee to furnish an answer but we may know somebody who knows somebody else who knows where to find the answer.

That's not nearly as silly or as funny as it may appear at first reading. At every convention so far this year the government's own representatives (who came to the meeting presumably to give answers) have said—"I can only give you MY interpretation," or—"There has been no official interpretation on that point as yet."

Now if the men who actually run these things day after day can't give the answer, we feel sure readers will bear with us if we do the best we can and tell EXACTLY what it says in the latest ruling.

Member of Audit Bureau of Circulations — Member Associated Business Papers, Inc.

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More than 8,000 copies of this issue are being distributed

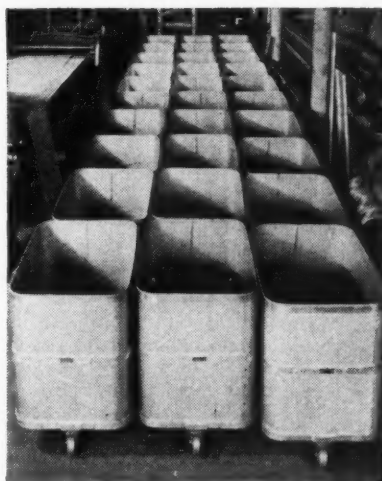


★ When Uncle Sam's boys are on the march it takes a lot of water to quench their thirst. So the engineers get busy an' fix up a rig that pumps up water, an' also filters it an' makes it pure. Which is where us sheet metal men come in, an' also Monel. For instance:

The water purifyin' outfits like you see in the picture are bein' made by different prime contractors clear across the country. They sublet the sheet metal work to local shops... who aren't turnin' out these tanks just two an' three at a time but in *sizeable lots*. Monel is used for these units because it's strong an' tough enough to stand up against abuse an' hard service in the field, stands up against the corrosives used, an' it won't rust an' contaminate the purified water.

Another typical job for the Army and Navy is Monel laundry trucks. Commercial laundries use Monel washers, table tops, pails, trucks an' what have you, because Monel takes plenty of bangin' around an' isn't corroded by water, soap, cleanin' solutions, an' etcetera. The Army and Navy uses the same. And now that our fighting forces are being brought up to full strength, much new laundry equipment will be required.

If you keep your eyes peeled you'll find war production is callin' for all kinds of unusual jobs in sheet metal. The Vitamin Dryer below, for example. This was made by a local sheet metal shop. It's used for dryin' vitamin compounds...which can spoil pretty easy if you don't use an absolutely rust proof metal like Monel, which is noted for keepin' contamination out of sensitive drugs, etcetera. Well, these vitamin com-



Monel Laundry Trucks

pounds are made into tablets an' sent to England to stop the children gettin' black-out blindness.

Now that we're goin' all out to win this war every skilled sheet metal man an' every helper is going to be important to Uncle Sam. In the meantime, if there's any way I can help you... either suggestin' where to go after Monel jobs or figurin' out how to handle them, just drop me a line.

Yours for Victory

Tim Shears

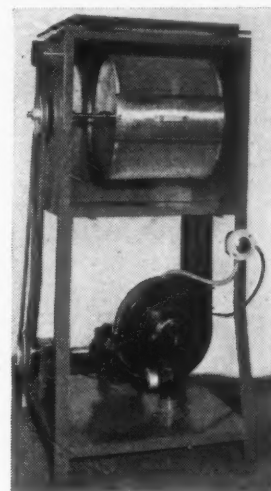
THE INTERNATIONAL NICKEL COMPANY, INC.
67 WALL STREET NEW YORK, N. Y.

Water
Purifying Unit

★ FIRST THINGS FIRST ★

With the Nation at war, supplies of Monel, Nickel and Nickel Alloys are needed for our armed forces. All efforts must now be aimed toward victory. In the meantime, The International Nickel Company will continue to issue information which it is believed will be of interest to metal users who are concerned with the war needs of today and the peace-time progress of the future.

Vitamin
Compound
Drying Unit



8

SUNBEAM

WARM-AIR FURNACES AND WINTER AIR CONDITIONERS



GET defense housing business with **SUNBEAM**! In the complete line there are units of all types, for all fuels, automatic and hand-fired for basement or first floor installation—in hall, closet, kitchen.

With **SUNBEAM** Winter Air Conditioner jackets finished in new Placid Two-Tone Blue and with new products and new improvements, the complete **SUNBEAM** line, including Gravity Furnaces, has more appeal than ever.

Remember too, **SUNBEAM** Units are backed by the world's largest Heating organization—American Radiator & Standard Sanitary Corporation.

Write today for literature and the name of the **SUNBEAM** Wholesale Distributor nearest you. For modernization, time payments are available in accordance with U. S. Government regulations.

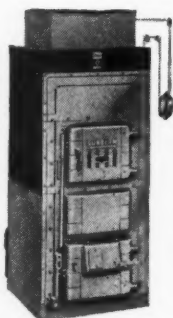


The products illustrated herein are normally available for prompt delivery. Our ability to furnish these, as well as the products shown in our catalogues, is subject to the needs of the National Defense Program.

AMERICAN RADIATOR & Standard Sanitary
New York CORPORATION Pittsburgh

WINTER AIR CONDITIONERS

For First Floor or Basement Installations



The Allerton (5520-X)
for Coal



The Wyandotte (SUV-55)
for Gas

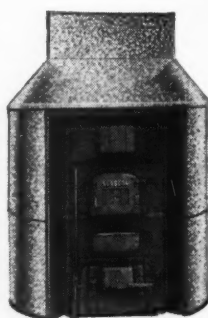


The Seneca for Gas

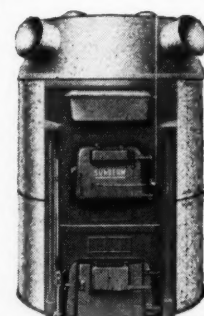
Compact, space-saving, the Allerton and Wyandotte can be installed in basement or on first floor—in hall, closet or kitchen. The Seneca is larger, ideal for basement installations.

GRAVITY FURNACES

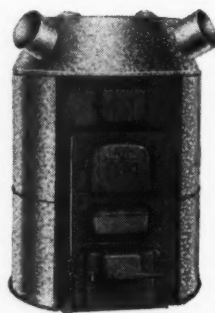
in Cast Iron or Steel Models



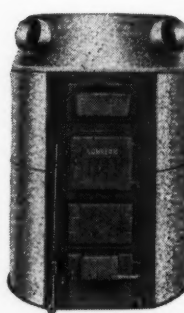
The Kenwood for Coal
A high quality pipeless cast
iron furnace in 5 sizes.



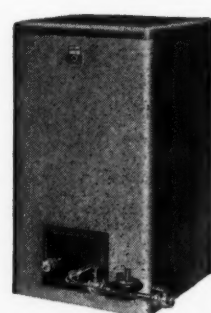
The Clifton for Oil or Coal
—stoker or hand-fired
"Ace" of steel furnaces.
Available in 6 sizes.



The Kenwood Cast Iron Furnace
for hand-fired Coal



The Arlington Steel Furnace for Oil
or Coal—stoker or hand-fired



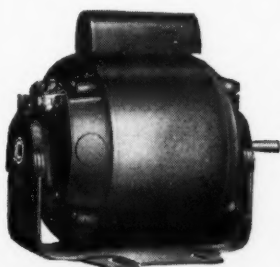
The Shawnee for Gas

Whatever the fuel, here are Warm-Air Furnaces designed to burn that fuel efficiently, sparingly. All are ruggedly built for years of service.

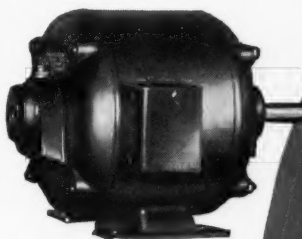
★ ★ DEFEND OUR COUNTRY. ENLIST NOW IN THE U. S. REGULAR ARMY ★ ★



Century Repulsion Start
with rigid base



Century Capacitor Motor
with cushion base



Century fractional
horsepower Squirrel
Cage Motor



Century Direct Current
Motor for all DC
applications



Century Split Phase
Oil Burner Motor

One of the Largest Exclusive
Motor and Generator Manufac-
turers in the World



★ *Look to*
CENTURY MOTORS
For DEFENSE JOBS
*Involving Heating, Cooling
or Ventilating Applications*

For the four widely diversified operations of air conditioning — air cooling, heating, circulating, and fluid pumping — you'll find the correct Century Motor. Century's wide variety of motor types and sizes, from fractional to 400 horsepower, assures the proper motor to balance the demands of every job.

Century Motors are designed and engineered to meet the specific demands of each particular application — not only those of the load, but surrounding atmospheric and local power service conditions as well.

On War business, Century has shortened the time necessary to make shipments of AC and DC Motors — particularly standard general purpose, splash-proof, enclosed, and totally enclosed fan-cooled and explosion proof motors.

For more of the advantages of using Century Motors designed for the applications of your industry, see your nearest Century Motor Specialist at once.

252

CENTURY ELECTRIC COMPANY

1806 Pine Street

St. Louis, Missouri

Offices and Stock Points in Principal Cities

THERE IS NO SUBSTITUTE for Quality

You encounter people in every line of business who think that low price is the first, last and only consideration in making a purchase. Yet, experience proves that the real and lasting bargains are had by those who insist on top-notch merchandise and workmanship.

At OSBORN'S, quality is the prime factor in determining a product's worth and the pride we take in our materials, tools and equipment is shared by those who use them. Year after year, these shop owners enjoy a steady growth in business and good-will because they have established a reputation for high-grade workmanship and materials at the right price.

Today, the majority of the OSBORN products listed in the adjacent columns are not obtainable in normal volume. Others are available only for defense requirements. Nevertheless, we are all making these sacrifices gladly in order that we may retain the rights for which our country is fighting. Yet, as we make them, let us remember that the jobs we cannot do now will be waiting for us and that there always will be a market for quality.

THE J. M. & L. A.
OSBORN Co
CLEVELAND, OHIO

BUFFALO • CINCINNATI • DETROIT
Manufacturers—Distributors of Metals and Metal Products

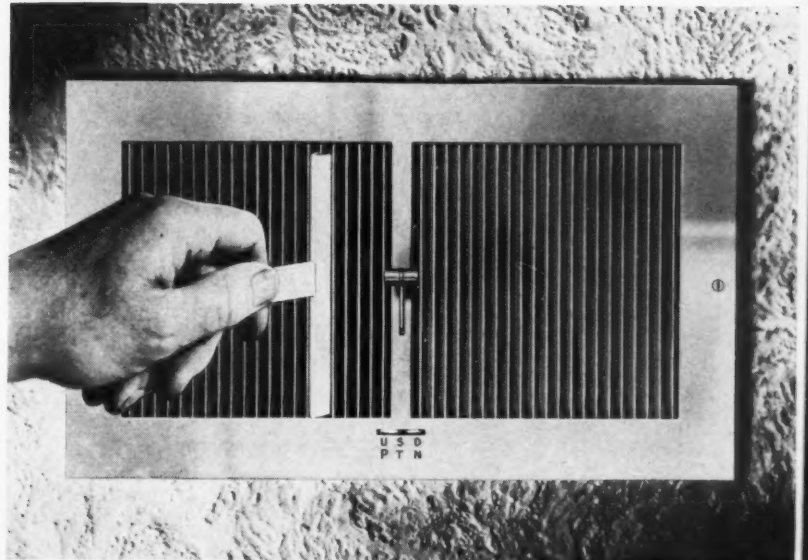
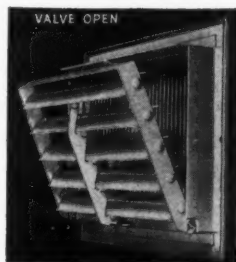
Asphalt—roofers	Roofing
Blowers	asphalt in rolls
Canvas	and shingles, felts,
Ceiling—steel	asbestos siding,
Conductor Pipe	roofers supplies
galv. steel,	coatings
Armco iron,	Roofing and Siding
copper,	galv. steel,
40 lb. terne	Armco iron,
Controls	copper, ternes
automatic heating	Roofing Ternes
Eaves Trough	40 lb. and 25 lb.
see conductor pipe	in IX and IC
Fans	15 lb. and 8 lb. IC
furnace, exhaust,	roll tin IX and IC
propeller	Screws—sheet metal
Furnace Pipe and	Sheets
Fittings	aluminum, steel,
Furnaces	iron, copper, zinc,
Grilles	stainless, long
Gutter, O. G.	terne, enameling
see conductor pipe	Sheets (Corrugated)
Hangers	Sheets
eaves trough	(Perforated)
and gutter	Sheets (Plated)
Hooks	chrome and nickel
conductor pipe	plated zinc,
and flashing	copper, tin and
Humidifiers	steel
Machinery	Siding
hand, foot and	galv. and painted
power	Solder and Fluxes
Nails	Tin Plate
Paints	charcoal, cokes,
tinner's red	imported dairy,
and house paints	roofing ternes
Paper	Tools
asbestos, red	every kind used
rosin, building,	in sheet metal
asbestos mill	Ventilators
board	roof and fan
Registers—warm air	Welding
Ridge Roll	equipment and
	supplies; spot
	welders

A DEPENDABLE SOURCE OF SUPPLY FOR 83 YEARS

FOR AIR CONDITIONING PERFECTION!

Use **H&C** No 75 Design
(NOT AN EXPENSIVE REGISTER)

No cold spots, no draft sensations, better distribution to the farthest parts of the room; these are the plus factors obtainable with the H&C No. 75 which make for supreme customer satisfaction. The answer lies in the H&C TURNING BLADE VALVE (used exclusively on H&C Nos. 75 and 86 Registers) which cuts down resistance to an unprecedented minimum and provides a much better air flow than the ordinary multi-shutter valve. Try No. 75 Design Registers on your next job. It's worth money to you to learn what a decided improvement in results the use of these registers makes. They cost no more than ordinary double deflection registers.

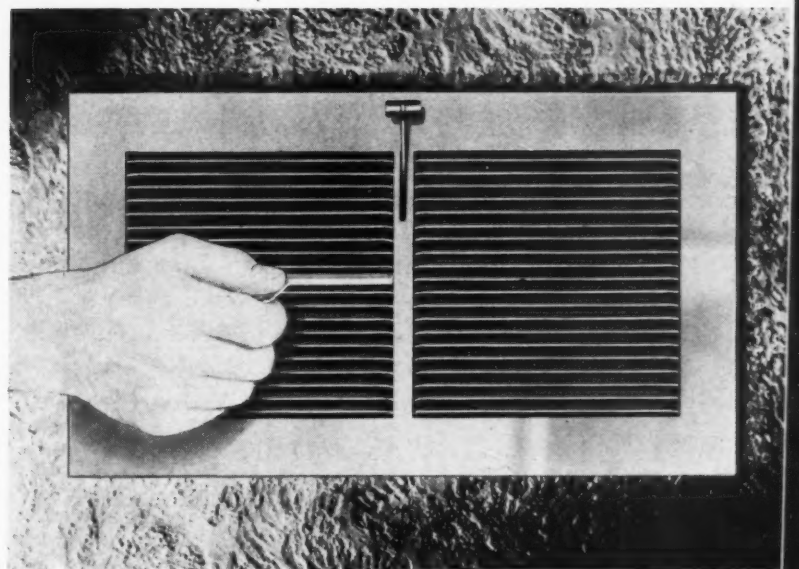


No. 751 REGISTER. Flexible-fin type. Equipped with the incomparable H&C Turning Blade Valve.

For BETTER-PLEASED CUSTOMERS in the LOW-PRICE BRACKET

Use **H&C** No 74 Design
(AN OUTSTANDING LOW COST REGISTER)

No. 74 is a single valve register with flexible fin face, priced so close to the cheapest registers on the market that it offers a splendid opportunity to step up the efficiency of your low-priced installations without adding appreciably to your costs. Here's what it will give you: MORE UNIFORM DISTRIBUTION, due to the downward deflection of the fins (as furnished) which counteracts the tendency of warm air to rise; ANY DEFLECTION DESIRED, UP or DOWN; ELIMINATION OF STREAKED CEILINGS: EXCEPTIONALLY GOOD APPEARANCE provided by finest workmanship throughout and complete concealment of the rough edges of fins. A good will builder worth many times the very slight extra cost involved over the cheapest registers available.



No. 741 REGISTER. Flexible-fin type equipped with positive action, single shutter valve.

Current Catalog: No. 42 combining Gravity, Air Conditioning and Furnace Accessory Lines. If not on hand, write us.

HART & COOLEY MANUFACTURING CO.

Warm Air Registers • Air Conditioning Grilles • Damper Regulator Sets • Dampers • Chain •

HOLLAND



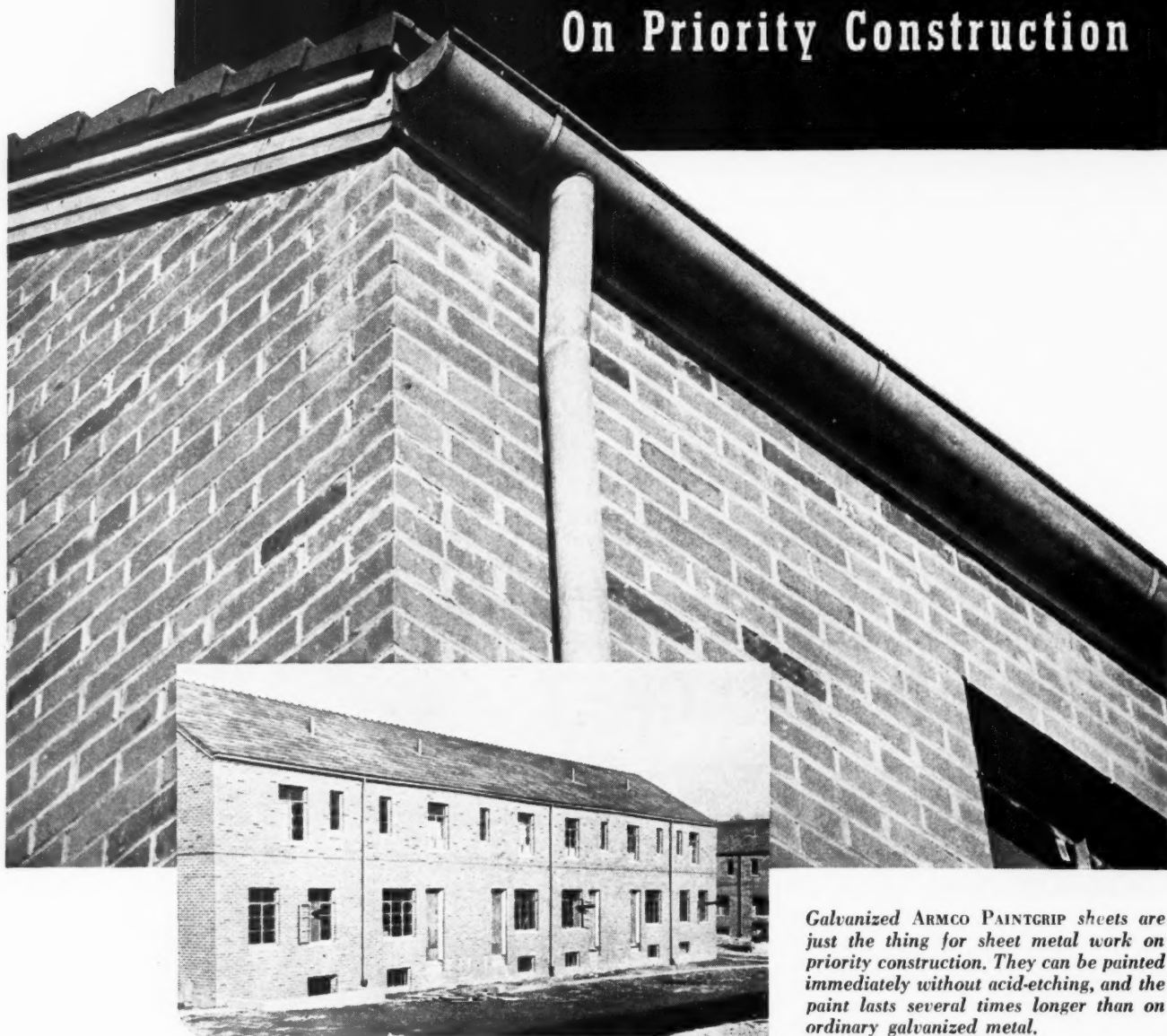
MICHIGAN

Chicago Office: 61 W. Kinzie St.

Philadelphia Office: 1600 Arch St.

It Gives You **DEFINITE ADVANTAGES**

On Priority Construction



Galvanized ARMCO PAINTGRIP sheets are just the thing for sheet metal work on priority construction. They can be painted immediately without acid-etching, and the paint lasts several times longer than on ordinary galvanized metal.

• War demands are pushing construction—pushing it fast. New plants and plant additions, and housing for workers, must go up rapidly. But that is not all—the jobs must *last*, and they must be *presentable* to help keep up workers' morale.

This is why galvanized ARMCO PAINTGRIP is getting the call for many important projects. This paintable sheet metal works as quickly and surely as regular gal-

vanized; and it can be painted immediately without acid-etching.

Both time and money are saved and, equally important, the paint lasts longer. The precious oils that keep paint soft, flexible and protective are shielded from zinc's dry-

ing-out action by a neutral phosphate coating applied at the mill.

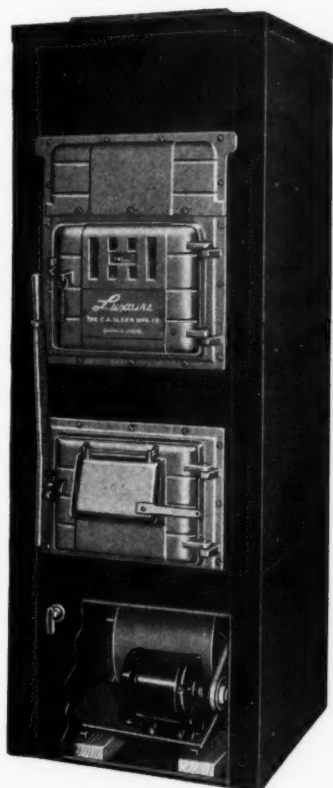
These facts about this *original mill-bonderized galvanized sheet* are worth remembering against the day when there will be enough ARMCO PAINTGRIP to go 'round. They will give you that "something extra" you will need to meet stiff after-the-war competition. Write today for a free scratch sample. The American Rolling Mill Company, 620 Curtis Street, Middletown, Ohio.



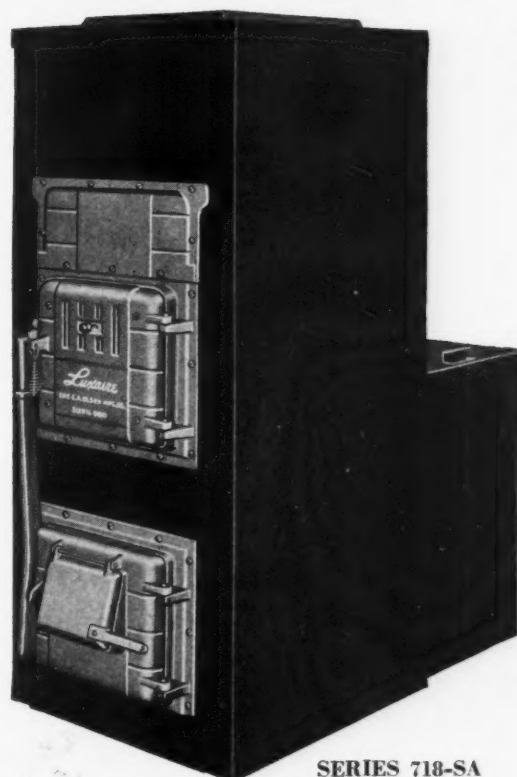
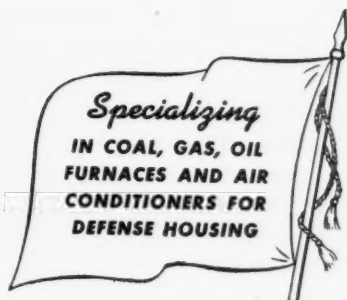
The answer to DEFENSE HOUSING HEATING

Luxaire

Low in cost . . .
High in sales appeal



SERIES 718-SH
Defense Housing
Forced Air Furnace, Hiboy Model.



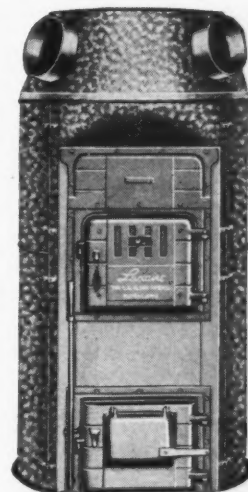
SERIES 718-SA
Defense Housing Forced Air Furnace.

★ Here is a brand new Luxaire Defense Housing Forced Air Furnace, No. 718-SA, with blower mounted at side or rear and No. 718-SH, Hiboy. The No. 718 is smaller than the original Luxaire Defense Housing Furnace, but has ample capacity to meet specifications of most government financed building projects.

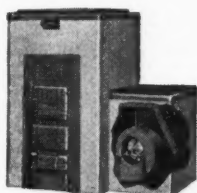
And it is substantially lower in price!
Write or wire for literature and prices.

See one of these sturdy, modern furnaces, without delay. Quote on the Luxaire to sell those publicly and privately financed housing projects, which you have been losing.

New!



SERIES 720-SAG
The Defense Housing
Gravity Furnace
at lowest price in
Luxaire history.



SERIES AC 700
Coal Burning Hand Fired
Air Conditioning Unit.
Stoker models available.



SERIES 8000
Oil Burning Air Condition-
ing Unit. Compact,
efficient.



SERIES H
Gas Fired Utility Air
Conditioning Unit.
For limited space.



SERIES C
Gas Fired Gravity Unit.
Economy for the
small home.

THE C. A. OLSEN MANUFACTURING COMPANY, ELYRIA, O.

Figurin' the Angles

What smart men do in these times to make money with Fiberglas* Dust-Stop* Air Filters



Free Sales Plan Helps You in These "Never Can Tell" Days

NEVER CAN TELL how much metal the defense program will call for. Never can tell whether you'll be able to get the metals you want. So, go get filter replacement jobs with this Dust-Stop Sales Plan and be ahead of the game.

Look at the selling-ammunition this sales plan has:

- Free mailing pieces, newspaper mats, postcards, radio scripts, reminder labels
- the biggest set of dealer helps in the

filter field! And all with your name printed on 'em free!

Besides that—

You've got the heavy-selling artillery of a nationwide advertising campaign behind you. Dust-Stop ads in American Home, Better Homes and Gardens, Life, Saturday Evening Post!

Suppose all this gets you a lot of filter replacement business . . . will it amount to real money? Figure it out. You can make up to \$2.00 or \$3.00 on each furnace, each year, for as many years as the furnace lasts. You service 200 to 300 furnaces, every year. Multiply those

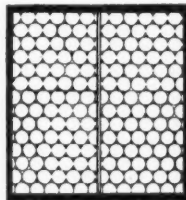
figures and you get a mighty tidy sum.

Then, there's the other business this Dust-Stop sales plan opens up . . . furnace cleaning, adjusting the automatic firing unit or oil burner, heating repair of all sorts.

• • •

So, move right into that wide-open filter replacement work. Write for Dust-Stop's

free sales plan now. Tell your jobber or manufacturer you want one, and he'll send it right away. Or, write to Owens-Corning Fiberglas Corporation, Toledo, Ohio. In Canada, Fiberglas Canada Ltd., Oshawa, Ontario.



FIBERGLAS* DUSTOP* AIR FILTERS

*T.M. Reg. U.S. Pat. Off.



How Copper Helps to Win the War

OUR COUNTRY'S war needs require nearly all the copper and the copper-zinc alloy, brass, that would otherwise go into such familiar peacetime uses as flashings, gutters, leaders, rustproof plumbing, or automobile radiators.

Today, a major part of available copper and zinc is needed for ammunition—cartridge cases, rotating bands on shells, time fuses, etc.

Tremendous quantities of copper go into wire and cable for vital electrical conductors in the war industries—in tanks, and bombers, and battleships.

Still more copper is needed for a variety of other uses . . . in naval and merchant ships of all types . . . in oil refineries, chemical plants, and the many other places where no satisfactory substitute exists.

So, in conserving copper and brass, you are strengthening America's war program. And the stronger it becomes, the sooner copper and brass will once again be available for unrestricted use. Meanwhile, new all-time highs in copper and zinc output are combining with our vast fabricating facilities to provide a typically American answer to ruthless aggression.

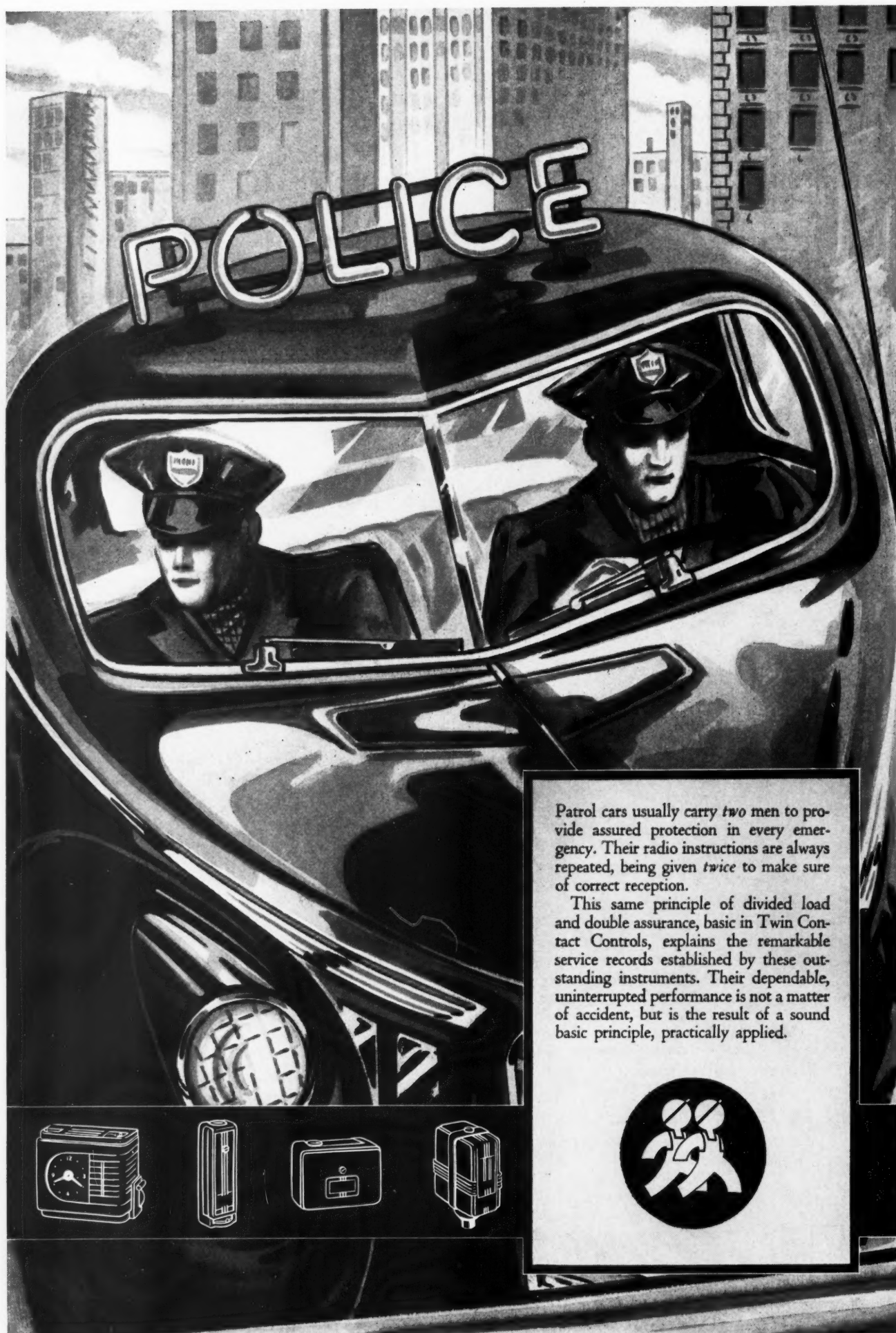
4234



Anaconda Copper



THE AMERICAN BRASS COMPANY • GENERAL OFFICES: WATERBURY, CONN.
Subsidiary of Anaconda Copper Mining Company • In Canada: ANACONDA AMERICAN BRASS LTD., New Toronto, Ontario



Patrol cars usually carry *two* men to provide assured protection in every emergency. Their radio instructions are always repeated, being given *twice* to make sure of correct reception.

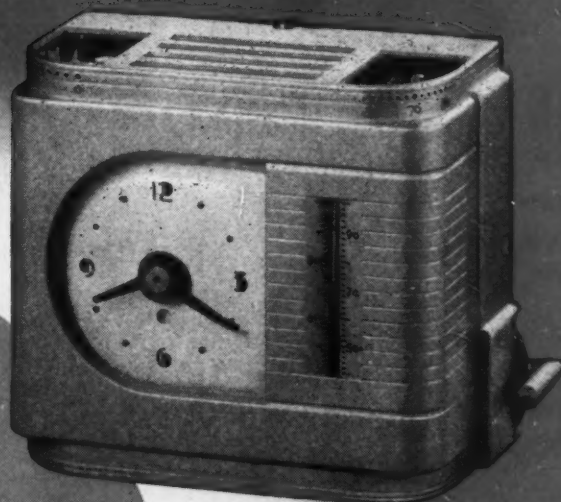
This same principle of divided load and double assurance, basic in Twin Contact Controls, explains the remarkable service records established by these outstanding instruments. Their dependable, uninterrupted performance is not a matter of accident, but is the result of a sound basic principle, practically applied.



No Mechanical Linkage in this Day-Night Control

Unlike the usual day-night controls, which change the temperature setting by complicated mechanical means, the Twin Contact Clock Thermostat is a single control which merely closes an electrical circuit to accomplish night setback and opens the circuit to restore day operation. This simplicity means better performance and less trouble, while the conventional clock face is easy to read. Both day and night operations are controlled by the Magic Dial, permitting the homeowner to adjust the instrument to the characteristics of his heating plant without disturbing the temperature setting, which is adjusted separately.

This unique clock thermostat, like the other instruments of the Twin Contact line, is sold under the name of the manufacturer of the heating equipment with which it is specially built to operate. If you sell any good make of automatic heating, your manufacturer can furnish Twin Contact Controls, including this simple, dependable clock thermostat. Ask him about it.



with the MAGIC DIAL

Twin Contact Controls

PERFEX CORPORATION

500 West Oklahoma Avenue, Milwaukee, Wisconsin

**For
Highest Efficiency
on
U. S. DEFENSE
and
HOUSING PROJECTS
INSTALL U.S.
REGISTERS**

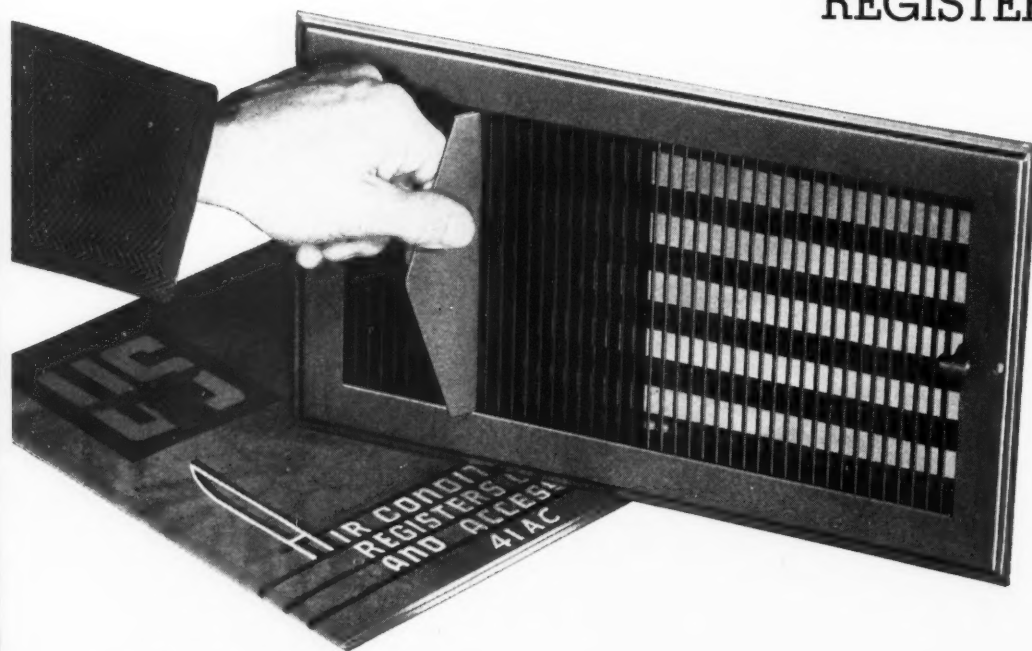
No. 40 SERIES GRAVITY BASEBOARD REGISTERS

Acclaimed by all heating contractors who have installed them to be "Superior to any type of register they have ever set" U. S. No. 40 Registers continue to set the pace this year.

More Free Area . . . Less Resistance . . . Non-Vision . . . Two-piece Construction . . . Metalac finish at Black Japan List . . . These features, and many more, is why we urge you to use U. S. No. 40 Gravity Baseboard Registers on Your U. S. Defense Housing projects this Spring.



U. S. No. 256 AIR-CONDITIONING REGISTERS...4-WAY FLOW



U. S. No. 256 Air-Conditioning Register is the Most Efficient and Mechanically Perfect Multiple-Valve Register made.

Gives **every** angle up-flow to 45° down-flow **without shutting off the register**. Grille Bar setting for Side Flows can be changed as required **without damage to grille or finish** with the Easy Setting Wrench.

The No. 256 can be used in **any style stackhead with full grille air-flow, full face coverage, and minimum resistance**. There is **no center mullion** to obstruct flow.



Send for 41G and 41AC Catalogs Today . . . Prices effective until March 1, 1942

UNITED STATES REGISTER CO.

BATTLE CREEK, MICHIGAN

MINNEAPOLIS • KANSAS CITY • ALBANY • SAN FRANCISCO • NEW YORK, N. Y.

Tampico

CAN TAKE IT!



Tampico Filters easily support the weight of two of the girls who help make them.

Tampico Filters do a better filtering job for several reasons. One reason is found in the Tampico Fibre itself—a fibre whose "natural" characteristics make it an ideal filter medium . . . a medium which is still

further improved by exclusive Tampico processing and flame-proofing. Another reason is simply the fact that Tampico Filters are rugged enough to withstand repeated tappings or cleanings. All filters eventually "wear out" because they become dirt-clogged—and, because Tampicos can be kept clean longer, their efficient filtering "life" is greatly prolonged.

WELDED ALL-STEEL FRAME

The back and four sides of the Tampico all-steel frame are spot welded into a single husky unit that is dip-painted after completion. "All-over" perforations permit perfect circulation throughout the entire area of the filter. Rugged strength is achieved as well as minimum resistance to air-flow. Find out about this "De Luxe Quality" Filter that costs no more than conventional types. **Do it today!**
Chicago Filter Company,
Joliet, Illinois.



SEND THE COUPON and...

"LOOK AT *Tampico!*"

Chicago Filter Co., Joliet, Ill.

Gentlemen: Send me my free sample. I'll look it over!

Name

Firm Name

Address

City State

TAMPICO FILTERS

"The World's Largest Exclusive Air Filter Manufacturers"

If you want Action instead of

CALL YOUR REPUBLIC SHEET DISTRIBUTOR FIRST

If you're looking for sympathy over your sheet supply worries, it's easy to get. But if you want *determined action* toward solving that problem, call your Republic Sheet Distributor.

When he's facing a customer's problem, he's in a fighting mood—for it's a challenge to his service and his business. He knows his help is needed *then* more than ever—and he's there to give it.

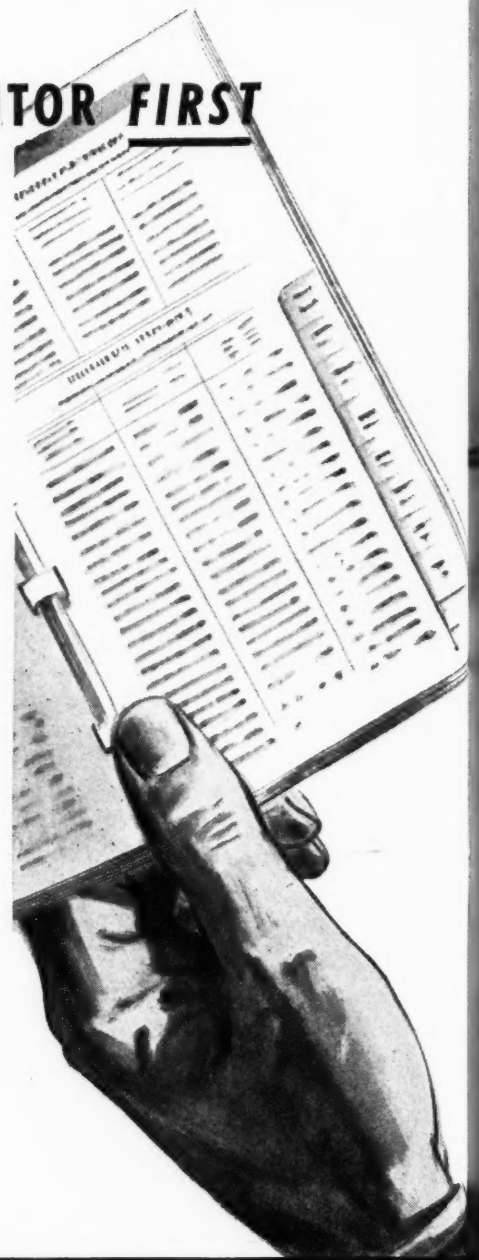
But with *Production for Victory* getting first call on steel, he may not be able to deliver all the sheets—Republic Steel, U-Loy* Copper-bearing Steel, Enduro* Stainless Steel, Toncan* Iron, Taylor Roofing Ternes—that you need. His stocks may not be as complete as

heretofore. His mill shipments may be slower. Still, he has many ways to attack your problem.

If it's a few sheets you need for a small rush job, or a quantity to get going on defense work, he can probably supply them promptly. He'll spare no effort to get sheets for you. He may have other grades in stock that you can use. His storehouse of information on fabrication, together with the booklet "How Toncan Iron Makes Money for Sheet Metal Contractors," may help you.

Use the many emergency services of your Republic Sheet Distributor. Call him *first* on sheet problems. Republic Steel Corporation, General Offices, Cleveland, Ohio.

* Reg. U. S. Pat. Off.



REPUBLIC *Toncan*

An alloy of refined open-hearth iron, copper

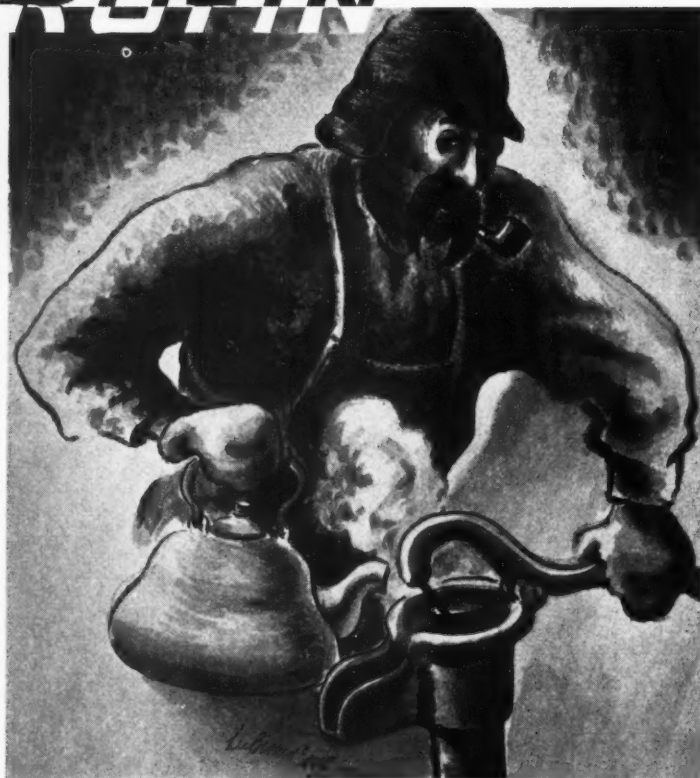
Apologies-



Iron SHEETS

and molybdenum — that grows old slowly

AEROFIN



YOU DON'T THAW OUT A PUMP THESE DAYS ...or do you?

Modern running water long since eliminated the necessity of thawing out the old hand pump. There is no reason why you should have to thaw out the coils in your heating system either. An innovation in heating surfaces—The Aerofin Nonfreeze Coil—eliminates bursting coils and assures uniform temperatures. • A tube within a tube, arranged to permit the flow of condensed steam through the return header against the incoming live steam, is the secret of the Aerofin coil. This unique arrangement provides modulation of the steam to any quantity without the danger of freezing.

The same rigid tests are applied to the Aerofin Nonfreeze Coil as are given all Aerofin heating coils. You can be sure of long life without interruption — no leaking, freeze-up, no clogging. Where temperatures make a difference — specify Aerofin.



AEROFIN CORPORATION

410 S. GEDDES ST., SYRACUSE, N. Y.

CHICAGO • DETROIT • NEW YORK • PHILADELPHIA
DALLAS • CLEVELAND • TORONTO

You're in step with changing conditions

... with **MUELLER'S**
complete furnace line,
keyed to today's
heating needs...

Just what you need for Defense Housing

... a wide range of moderately-priced units, designed for high efficiency with specific fuels, and specially engineered for this defense housing market... War or no war, your prospective customers still prefer good-looking, nationally-known equipment—and, for the sake of your reputation, you still want to deliver performance that *keeps* them sold... It pays you to stay with Mueller — for "the duration" and after. If you need heating equipment for a single defense house or a large group of houses — for factory buildings, hangars, warehouses, etc.—for use with any fuel — ask your nearest Mueller distributor or write *L. J. Mueller Furnace Co., 2010 W. Oklahoma Ave., Milwaukee, Wisconsin.*

★ ★ ★

In 1942 concentrate on these classes of work, rated "essential" to war effort:

- *High-priority defense home-building*
- *Home modernization for added dwelling units*
- *Necessary furnace replacements*

— and look to Mueller for the moderately-priced furnaces you need for \$6000 "defense homes" — as well as home modernization.

D-23

GAS

OIL

COAL

New MUELLER SERIES CVP ALL-CAST-IRON GAS-FIRED WINTER AIR CONDITIONER. Small, compact, cabinet type for utility room or basement.

MUELLER FLO-AIRE GAS-FIRED FLOOR FURNACE. Completely self-contained. Also Dual Flo-Aire with wall registers for two adjacent rooms.

MUELLER SERIES SHP STEEL GAS-FIRED WINTER AIR CONDITIONER. Attractive, compact cabinet type for utility room or basement.

New MUELLER SERIES G90 GAS-FIRED GRAVITY FURNACE. Highly efficient up-draft design. Round or square casing.

New MUELLER SERIES OVP VERTICAL OIL-FIRED WINTER AIR CONDITIONER. Equipped with Mueller Vaporizing Oil Burner. Burner and controls enclosed.

New MUELLER SERIES OHP HORIZONTAL OIL-FIRED WINTER AIR CONDITIONER. Equipped with Mueller Vaporizing Oil Burner. Burner and controls exposed.

MUELLER SERIES F & G COAL-FIRED CAST-IRON FURNACE. Known for its unflinching performance. Also "Eternal" Furnace, guaranteed for 20 years.

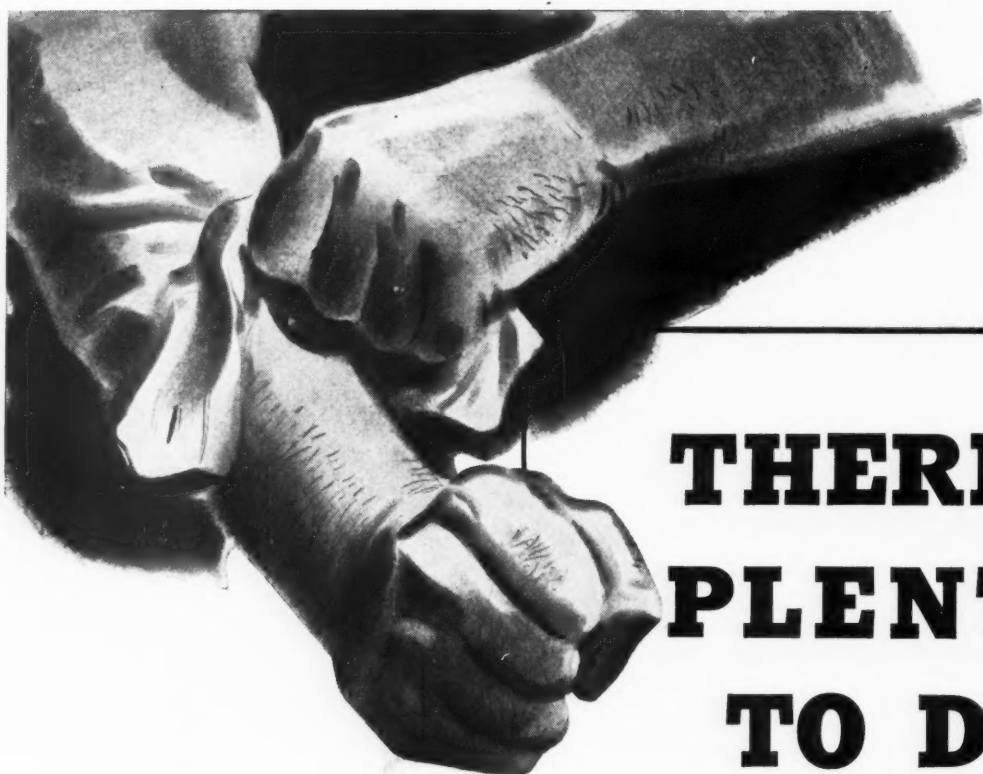
MUELLER SERIES 400 COAL-FIRED STEEL FURNACE. Dependable, economical performance.



MUELLER

HEATING AND AIR CONDITIONING

Milwaukee



THERE'S PLENTY TO DO *in '42*

HUNDREDS of thousands of Defense homes are being erected . . . they require heating installations. Add the heating demands of our vastly expanded industrial plants. Then consider the service needs of existing installations which must be repaired to afford comfort and prevent fuel waste.

It's easy to see that the heating industry—like all others in America—has plenty to do in '42. And it's a job that's vital to victory, too—maintaining morale on the home front, and helping make possible the production of arms for our fighting men.

You men in particular who install and service heating equipment in factories and homes, are called upon to do your utmost to make that equipment operate efficiently and economically

—to prevent fuel waste. And it's not a simple job, with shortages of materials and long delays on orders.

In support of your vital job, Penn pledges to do its utmost to supply needed controls and to furnish them with reasonable promptness. Our armed forces naturally have first call on our facilities—but we are determined to serve the needs of the heating industry as fully and as promptly as possible. So . . . remember, you can depend on Penn again in '42 for efficient heating controls. *Penn Electric Swith Co., Gosben, Ind.*



REFRIGERATION, AIR CONDITIONING, ENGINE,

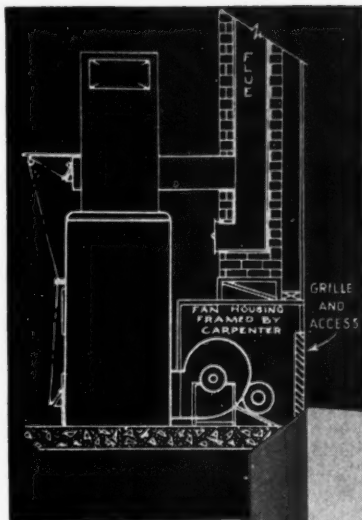
CONTROLS

HEATING, PUMPING AND AIR COMPRESSOR

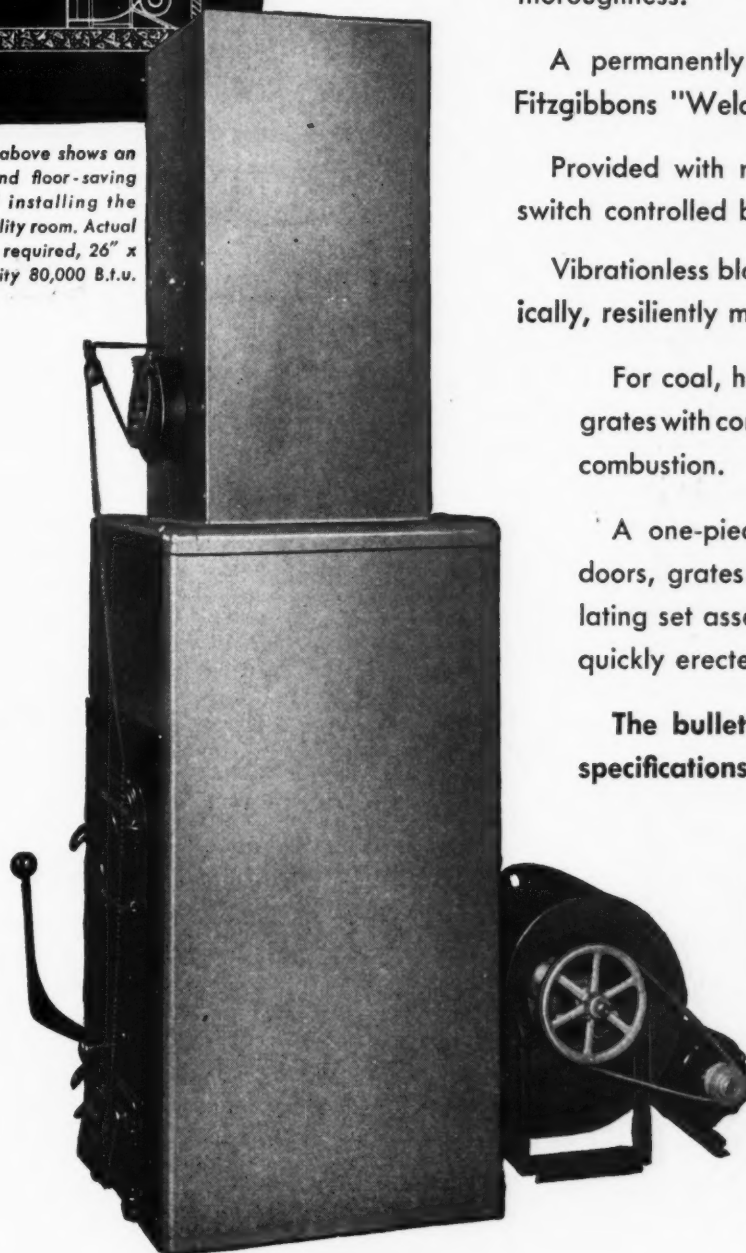
Heat defense homes with the

FITZGIBBONS

80 FWA WARM AIR CONDITIONER



The sketch above shows an effective and floor-saving method of installing the unit in a utility room. Actual floor space required, 26" x 26". Capacity 80,000 B.t.u.



Designed to government specifications, and built of heavy steel with characteristic Fitzgibbons skill and thoroughness.

A permanently dust- and gas-tight unit due to Fitzgibbons "Weldseal" construction.

Provided with motor-driven blower with automatic switch controlled by bonnet temperatures.

Vibrationless blower balanced statically and dynamically, resiliently mounted for quiet operation.

For coal, hand fired. Heavy, long life grey-iron grates with correct size air spaces to insure complete combustion.

A one-piece unit, shipped with fire and ash doors, grates and firebrick liner, and hand regulating set assembled in place. Jacket and plenum quickly erected. Minimum duct work required.

The bulletin carries the complete story and specifications. Get your copy—mail the coupon.

AA-2
Fitzgibbons Boiler Company, Inc.

101 PARK AVENUE, NEW YORK, N. Y.

Send me the bulletin about the
Fitzgibbons 80 FWA.

Name.....

Address.....

City and State.....

YOU CAN DO BUSINESS IN 1942—SELLING MONCRIEF FURNACES

**SPECIALY DESIGNED
for LOW COST HOMES**



Here are Moncrief furnaces to meet the new conditions that confront builders and heating contractors in 1942. These new units are right in every particular—sizes, heating capacities, quality and prices. They meet every specification for defense housing.

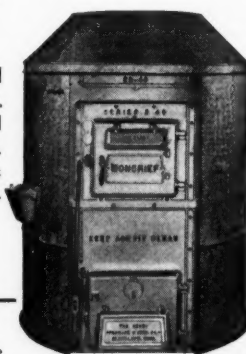
No. 16 CAST FORCED AIR Furnace. Cast 16" furnace with dome radiator. Very compact and efficient; 60,000 B.t.u. at registers; cabinet 26" x 26" x 7' 3" high; blower cabinet 24" x 24". Electric driven blower produces forced air circulation, adapting it to basementless homes. Attractively finished. Priced right down to rock bottom.

SERIES C CAST. Here's top quality with the famous Series C design and construction in 18", 20", 22" and 24" sizes—sections cast in one piece (two-piece fire-pot) heavy and smoothly finished; duplex roller-bearing grates, and all other fine features you expect in a high-grade furnace.

SERIES D-40 STEEL. Made in 20", 22" and 24" for defense housing requirements. Combustion drum is heavy O.H. steel with head riveted as well as welded. Large welded radiator. No bolt holes open into combustion chamber. A high-grade furnace in every particular.



Series C Cast



Series D-40

*Send for New Circulars
and Prices*

THE HENRY FURNACE & FOUNDRY CO.

3473 E. 49TH ST., CLEVELAND, OHIO



Section of the Hall-Neal Furnace Company plant at Indianapolis showing location of Lockformers.

*"...more than
paid for
themselves.."*

**SAYS MR. GUY VOORHEES
OF THE HALL-NEAL
FURNACE COMPANY**



Mr. Guy Voorhees

● In a recent letter to the Tanner Company (Lockformer Distributors in Indianapolis) Mr. Voorhees writes, "Both of the Lockformers purchased from you are doing highly satisfactory work in our shop. There is no doubt that these two machines have saved us a great deal of time and, as you know, time is money. We have no doubt that they have more than paid for themselves."

YOUR LOCKFORMER WILL PAY FOR ITSELF QUICKLY, TOO!

Lockformers cut labor costs so drastically that savings soon pay back the original investment. Shop capacity is greatly increased without the necessity for additional floor space. And, because shop men are relieved of tiring manual labor, they have more time to spend at skilled labor—doing jobs that require brains instead of mere brawn.

There are five different Lockformer Models . . . auxiliary rolls for Double Seam Locks and Drive Cleats . . . Power Flanger Attachments, etc.

One man and a Lockformer can make more Pittsburgh Locks than sixteen men working at eight brakes.

Send the coupon for complete information on the extensive Lockformer Line of sheet metal working equipment. You'll find a model to fit your particular needs as well as your particular pocketbook.

Lockformer Co.,
4615 Arthington, Chicago, Ill.

Gentlemen: Please send me the Lockformer Catalog. (No obligation on my part.)

Name

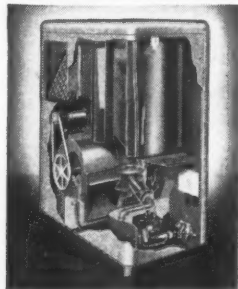
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City..... State.....

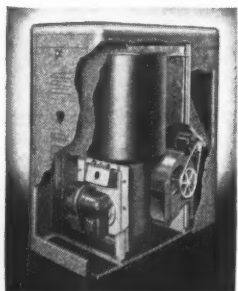
THE LOCKFORMER co.

4615 ARTHINGTON STREET, CHICAGO, ILLINOIS

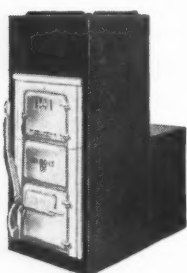
RYBOLT



RYBOLT Series RS
Gas-fired Automatic
Heating Unit



RYBOLT Series RO
Oil-fired Automatic
Heating Unit



RYBOLT Series
DH-70S Coal-fired
Forced Air Unit



RYBOLT Series 1815
18" Gravity Furnace



● Here's big news from Washington for RYBOLT jobbers and dealers . . .

The National building program for this year will probably exceed by a billion dollars the 1941 figure of \$10,400,000,000.00. This is over and above the amount involved in the proposed stoppage of all civilian building . . .

Included in this staggering figure of over eleven billions is approximately \$600,000,000.00 of publicly financed war housing . . . \$100,000,000.00 more than last year . . . and even this may have to be largely increased.

Out of this housing total, \$185,000,000.00 is allocated for 70,000 prefabricated demountable houses . . . a most significant new development. Two kinds of prefabrication are represented . . . completely factory built houses and houses built at site . . . both kinds demountable . . .

These prefabricated houses . . . as well as practically all houses in the whole war building program . . . are necessarily small and low priced. Hence, extremely compact, low priced heating units will be required.

The RYBOLT complete line for 1942 gives you an exceptional opportunity to get your share of this immense heating business because it includes a number of units especially adapted for the *price* and *size* limitations of War-Time housing. At the left are shown four such units . . . recent additions to the RYBOLT line . . . fired by coal, gas, and oil.

These units are all compactly designed to fit in small space . . . all highly efficient and dependable, yet low in price . . . *all ideal in every way for Factory Prefabricated or Site Prefabricated houses . . . in fact, any type of small or medium sized house.*



WRITE FOR DESCRIPTIVE FOLDERS

THE RYBOLT HEATER COMPANY
615 MILLER STREET • ASHLAND, OHIO



Curtailment Is a Challenge, Not a Catastrophe

IT has been brought home forcefully to men who have attended conventions held to date that curtailment and conservation are very much in the mind of those who are now invested with authority to win this war.

It will be brought home, no doubt, to many others who, in the next two months, attend conventions scheduled. And those who do not go to conventions will, without doubt, find plenty of confirmation in the restrictions which will be applied more and more widely, to more and more materials or products, to more and more persons—as the weeks pass.

For the man in business, these curtailments will be of two general types. First, those curtailments which directly affect his business. Second, those curtailments which affect all the things he buys to eat, to wear, to operate his household.

Our industry, so far, has been dealt with more generously than have some other industries. Our heating work, for example, so far has and probably will be held in Washington to be an essential. New houses we will build must be heated. Existing houses must have their heating plants maintained.

We will have to accept, however, that new house heating systems may not have sufficient material to enable the installer to follow last year's standards. Furnaces will be smaller; probably the number of furnace sizes permitted will be curtailed to a few capacity classes; houses will be insulated down to these furnace capacities or the house will have to be built smaller. Close-coupled systems is the best designation we can think of at the moment for the kind of system Washington will insist on. By close coupled we mean baseboard registers for houses with basements; high side wall registers for utility room installations. As few returns as possible and located on inside walls; it is under consideration that number of returns will be determined by this rule—air re-

turning to the furnace shall cross no more than one room to reach the return air grille. For the small, defense house that means one return in the central hall.

Metals will be taken off the available list just as fast and just as completely as investigation discloses substitutes which can be used instead. It is even talked about—no metal for duct systems except elbows and fittings; everything else a substitute.

The ruling is—existing plants can be maintained, but cannot be improved. That literally means a fire pot for a fire pot (not a new furnace); a smoke pipe section for a section (not a complete new pipe); grate bar for grate bar (not a stoker or an oil burner). And this also means that a gravity furnace cannot be removed and a forced air furnace substituted.

We know, of course, that new furnaces are much lighter than old furnaces. We could add considerably to the nation's scrap pile by replacing old with new—but for the moment, that's out. We also know that new furnaces use less fuel than old furnaces—but that's out. Maybe these rulings will be changed, but the chances are not worth a bet now.

But it doesn't look like a too-bad year. We know we need to build 500,000 new houses. We know materials will be available to maintain existing heating plants and that there's enough of this work ahead to keep most of the industry busy. We know industrial plants will be built or put in condition—requiring much sheet metal work. We know that every shop which can possibly manufacture war items will be given a chance—and expected—to take as much of this work as possible.

The point is—let's keep our eyes open; let's get off our pants and go to work; let's use our ingenuity to find ways and means to overcome these obstacles. If we do, 1942 will be one of the busiest years yet.

Defense Developments

OFFICE OF PRODUCTION MANAGEMENT
SOCIAL SECURITY BUILDING
WASHINGTON, D. C.

January 27, 1942
Refer to: 3-D-8

AMERICAN ARTISAN
6 North Michigan Avenue
Chicago, Illinois
Gentlemen:

The Government has recognized that repair and maintenance of plumbing and heating are essential. In the Production Requirements Plan (for manufacturers) and in Suppliers' Order M-67 (for wholesalers and dealers) a plan has been devised for the production and equitable distribution of plumbing and heating supplies to be used for the repair and maintenance of homes, farms, retail stores, and commercial concerns.

While the Production Requirements Plan and Order M-67 may be supplemented by other measures, they now constitute an informal repair and maintenance plan for plumbing and heating.

M-67—an inventory control measure—depends for its success upon the prompt and full cooperation of manufacturers in the Production Requirements Plan. Manufacturers should fill out and submit *without delay* their copies of PD-25A. The ability of wholesalers and dealers to obtain inventories of repair and maintenance items hinges upon the quick response of manufacturers to their request. The work of the Plumbing and Heating Branch of the War Production Board will be greatly hampered if we do not receive the quick and whole-hearted cooperation of manufacturers.

Your action in bringing speedy news of the repair and maintenance plan to the Plumbing and Heating Industry will be a real service. Your continuing cooperation in urging manufacturers to submit PD-25A will be of great help to this Branch and will assist the war effort in which we are all engaged.

Very truly yours,

W. Walter Timmis, Chief,
Plumbing and Heating Branch.

War Production Clinics

A SERIES of clinics to show small manufacturers how they can turn their facilities to war production will be held by the War Production Board in manufacturing sections of the nation in the next few weeks.

These meetings will educate small manufacturers on how their own tools may be put to use in turning out parts.

Insofar as possible the clinics will be scheduled in sectional groups. This gives prime contractors a chance to cover several clinics with the same representatives and with single sets of samples, blueprints and specification data.

A typical War Production Clinic was held in the State Armory at Lowell, Mass., on January 19. More than 5,000 representatives of small businesses in Maine,

New Hampshire, Vermont and Massachusetts availed themselves of the opportunity thus offered to consult with the prime manufacturers with a view to obtaining sub-contracts.

As a result of this one clinic a total of \$50,000,000 will be spread among small industries in New England, according to estimates of officials of the Contract Distribution Branch of the War Production Board.

Approximately 10,000 square feet of floor space was devoted to booths at which 39 prime contractors exhibited the many different articles which the small manufacturers can produce for them. A large bulletin board was erected near the main entrance to the armory, conspicuously listing the names of the 39 prime contractors and the different items, largely products of machine work, for which they are in the market. In addition, a spokesman for each of the prime contractors explained over a loud speaker system just what his company had to offer the small contractors.

Officials of the War Production Board and other Federal agencies were present to advise and assist manufacturers in negotiating for work which they believed they were qualified to perform.

Blower Excise Tax

R. A. Mayne, Sales Manager,
The Lau Blower Company,
Dayton, Ohio.

Gentlemen:

Reference is made to your letter dated December 15, 1941, which relates further to the question of the taxability of sales of blowers under the provisions of section 3405 (d) of the Internal Revenue Code, as amended.

It appears from the evidence submitted that blowers used in connection with self-contained air-conditioning units are made of special material or are treated specially to resist corrosion. Presumably, blowers not so made of special material or not so treated specially are unsuitable for use with, or as part of, self-contained air-conditioning units due to the relatively high humidity atmospheres present in such units.

If as a matter of fact blowers which are not made of special material or are not treated specially are never used in connection with self-contained air-conditioning units, it is the opinion of this office that such articles are not taxable blowers within the meaning of section 3405 (d) of the Internal Revenue Code, as amended. In other words, black iron or untreated blowers do not have actual, practical, commercial fitness for use as part of, or with, self-contained air-conditioning units.

Under the circumstances it is held that no tax under the provisions of section 3405 (d) of the Internal Revenue Code, as amended, attached to sales by the manufacturers of blowers which are not corrosion resistant and, hence, are not suitable for use as part of, or with, self-contained air-conditioning units.

(Signed) D. S. Bliss,
Deputy Commissioner,
Treasury Department.

42,000 Demountable Homes; 5,667 Trailers

LARGE-SCALE expansion of defense housing was promised January 7 by Defense Housing Coordinator Palmer, in announcing that President Roosevelt had allocated \$153,000,000 to the Federal Works Agency for approximately 42,000 demountable houses to be built in some 50 defense areas throughout the country. In addition, \$13,000,000 was allocated to the Farm Security Administration for 5,667 trailers and 5,200 dormitory units, to be located in 22 localities.

Designed for rapid erection and ready removal to other locations when necessary, demountable housing is considered by experts the best answer to acute housing shortages in defense communities where the population is expected to decline in the post-war period, and where ghost towns might result from too much permanent construction to meet emergency needs. While demountable houses need not necessarily be prefabricated it is expected that a large proportion of the projected 42,000 homes will be built by the latest streamlined construction methods.

Funds released by this action apply to the following communities, where Presidential approval of defense housing has already been announced but where funds have hitherto been unavailable for construction:

Alton-E, Alton, Ill., 200 units; Campo, Calif., 30; Dayton, Ohio, 750; Elkton, Md., 350; Greenport, L. I., 50; Jackson-Flora, Miss., 350; Jackson-Milan-Humboldt, Tenn., 200; Keyport, Wash., 125; Quantico, Va., 250; Sacramento, Calif., 125; Sebring, Fla., 193; Shreveport-Minden, La., 200; Springfield, Ohio, 250.

Previously programmed as permanent housing, now changed to demountable: Buffalo (Cheektowaga), N. Y., 1,050; Buffalo (Lackawanna), N. Y., 400; Mobile, Ala. (Brookley Field), 1,060; Morgantown, W. Va., 150; Muscle Shoals, Ala., 100; Orange-Beaumont-Port Arthur, Tex., 300; Philadelphia (Bristol), Pa., 200; Seattle, Wash., 100.

Milwaukee War Production Exhibit

APERMANENT war production exhibit has been set up in Milwaukee to give continuing impetus to the program for spreading war manufacture into every available plant announces Clifford E. Ives, state director of contract distribution under the new War Production Board.

The exhibit will be, in effect, a huge store in which prime contractors will spread out parts and blueprints so smaller manufacturers may come to "shop around" for kinds of work they may be able to handle in their plants.

The exhibit will occupy 5,000 sq. ft. leased on the seventh floor of the Plankinton arcade building, 161 W. Wisconsin Ave.

The exhibit was to open the week of Feb. 9.

Army Camp Construction and Heating

PROFESSOR KONZO reported to the Repairs and Utilities Section of the War Department in Washington on Monday, January 12. At the request of this Section of the War Department he made a survey of the forced warm air heating equipment in a number of Army camps located in the Northeast and Southeast sections of the country.

Many problems have developed in connection with

some of the forced warm air heating installations in Army camps. Professor Konzo should be in a position to present a broad program to the Repairs and Utilities Section which will prove to be very helpful in overcoming operational problems.

It is suggested that every manufacturer who has sold heating equipment for the Army camps should make it his business to keep those units sold by having one or more experienced engineers call at these camps and to assist in correcting any complaints that arise before they begin to pile up.

Approximately a dozen new camps would be put out for figures. It is possible that these camps will be figured on a lump sum basis which means that figures will be taken by the Divisions or Districts of the U. S. Engineering Corps in which the camps are located. So far as known there will be no change in connection with warm air heating specifications in connection with the Army camps planned. Also in connection with any future camp building program, no consideration is now being given to group heating of barracks buildings with steam.

U. S. Engineering Corps has taken over the functions of the Construction Division of the Quartermaster Corps of the Army. Contractors should immediately write to each Division and District telling them that you would like to have the name of your company on file to receive invitations to bid, covering warm air heating equipment. All kinds of equipment is being purchased by the various corps areas including heating equipment. You might also ask that if equipment is to be purchased through general contractors instead of the Army that the names of such contractors be submitted to you.

George Boeddener
Managing Director,

National Warm Air Heating & Air Conditioning Ass'n

Simplification Program

A program of simplification of the various classes of products of the Plumbing and Heating Industry is now under way. The purpose of this program is to conserve critical material. The help and advice of the industries affected is sought in working out these programs.

To that end, representative technical groups of industry members have been meeting with members of the Plumbing and Heating Branch and other interested Government officials.

The meetings as scheduled and those invited to represent the various named industries are as follows:

Warm Air Furnaces—January 28, 1942

C. Ackerson, Agricola Furnace Company.
L. R. Taylor, International Heater Co.
C. S. Franke, American Furnace Company.
C. L. Hewitt, Jr., L. J. Mueller Furnace Co.
A. W. Wrieden, Lenox Furnace Company.
R. S. McNaney, Dowagiac Furnace Company.
P. T. Cheff, Holland Furnace Company.

Warm Air Furnace Pipe and Fittings—January 30, 1942

G. L. Laytze, Williamson Heater Company.
F. E. Ford, Excelsior Steel Furnace Co.
Samuel Corbman, Corbman Brothers, Inc.
E. R. Johnston, Char-Gale Manufacturing Co.
John K. Dougherty, Lamneck Products, Inc.
P. T. Cheff, Holland Furnace Company.

PD 25A-PD 25X

Probably you have heard of PD 25A, the manufacturers' inventory control regulation and M 67, the jobbers' inventory control. But don't pass up a reading of this explanation because you think "I'm not a manufacturer." If you now or later fabricate any war product—you become a manufacturer. If your volume is over \$100,000, use PD 25A—if under \$100,000 use PD 25X. Following is an explanation of both control measures.

THE Production Requirements Plan supersedes and takes the place of the old Defense Supplies Rating Plan which was designed to assist the manufacturer of defense products to obtain material to manufacture the product to the extent that it was used for defense.

In the old plan the manufacturer got 70 percent of his raw material to produce his product if his product was sold from a dollar volume standpoint, 70 percent for defense as defined in the plan itself.

The other feature of the defense supplies rating plan was that it carried an A-10 rating for everyone, regardless of who he was or what his type of business was. We have now operating under it some two thousand different manufacturers in some one hundred and twenty-five different industries. The plan took care of any producer so long as he produced a defense product.

PD-25A for Manufacturers Only

The Production Requirement Plan is designed to take care of practically any type of manufacturer and any type of product. It applies, however, *only to manufacturers*; it does not apply to a distributor or anyone except a concern that actually produces a product.

It makes an allowance for a varying rating; it is not confined to an A-10 rating; we can give a rating varying with the value of the product to the defense program and the essentialness of the product to the civilian economy.

You should submit your application on the basis of the narrowest inventory breakdown of raw materials maintained. If you make one or two classes of product and you keep only one inventory for the raw materials to manufacture those classes of product, you need make only one application. If you have two or more inventories which you can segregate physically which apply to various products, we would like a separate application in terms of each of those raw material inventories.

When you have qualified under the Production Requirements Plan (when you have received back your Form PD-25A), all you need to do to extend that rating is to endorse on your purchase order the endorsement given in the lower right-hand corner of this instruction sheet. It gives the exact wording of the endorsement, and the endorsement should appear exactly in this form on each of your purchase orders to which you wish to apply the rating granted to you under the Production Requirements Plan.

Some Simplification Features

You do not have to execute an acceptance to OPM; you do not have to send a copy of the order to each of your suppliers. When *your* supplier wishes to extend the rating to *his* supplier, he does execute an acceptance, which is a single sheet of paper and simply says that he has read the order, that he understands the terms of it, and that he accepts the terms of it; and having once accepted the terms of the order, which he may get from you for the first time, he doesn't have to accept it every time he gets a copy of the order from another supplier or every time he gets an extension of a rating under this plan from another supplier. There are no report forms in this plan to OPM other than the report form itself which is sent in each quarter. The plan is based on calendar quarters.

Another feature of the plan is that when you get your rating we do not specify that the rating only applies to deliveries *within* the quarter. It applies instead to purchases *placed* during the quarter, and the delivery date is left open.

Getting into the form, section B calls for information as to dollar shipments of classes of products manufactured by the applicant and we give space there for a number of classes of product.

By "classes of product" we want whatever classification you have been in the habit of using in your own business for sales statistics of one sort or other. We ask for this in units and dollar volume, but if you do not keep units you may list and give only the dollar volume.

Inventories Recorded by Quarters

In Section C we ask for a general inventory report as of three separate dates: June 30, September 30, and the date of the most recent physical inventory. Again, if you don't have an inventory as of June 30 but you do have one of July 31 and you don't have one of September 30 but you do have one of October 31, you may substitute those; however, we do want them three months apart. There are some of you, perhaps, who do not actually take a physical inventory but you have a book figure which may be adjusted from time to time. Most concerns, of course, do take a physical at least once a year, and that is the date we want for the last part of Section C.

Editor's Note: For filing in February, 1942, quarters should be shifted ahead one quarter.

We ask for the inventory in terms of raw material, work in process, finished goods, and supplies, and any

other kind of inventory that you may keep which is peculiar to your business. We ask you to state the basis used in determining the dollar values used in this inventory, that is, the cost, cost or market, in other words, whatever you keep, the way you keep the record.

We would like to have work in process and finished goods expressed in terms of raw materials only; we would prefer it that way. If you don't keep it that way, if you include overhead, labor, either or both, in your figure, give it to us; but state the fact that that is the figure you have given us.

We want "supplies" in whatever terms you keep that account. That account is supposed to represent maintenance, repair, and operating supplies. A number of companies don't keep operating supplies; if you don't keep it, don't put it down. Other companies don't keep "work in process" and "finished goods" separated; if you don't keep it, we will take what you have, certainly for your first quarter.

Section D Shows Your War Work

Section D is very much the meat of the whole form. It is divided into two parts. The first part is a classification of your shipments *by preference ratings*. That section is designed to give us a picture of your business in terms of rated shipments as they apply to defense, and would like to have that period cover three months. As a minimum, cover the most recent month for which you can get us the figures. Then in this pattern is listed the dollar volume of shipments falling in each of these rating categories. If you haven't records which break it down into A-1-A, B, and C, and so forth, you may group those ratings, but we would like to have as much of a breakdown as is possible for you to give us. Below the actual preference rating pattern, that is, below the A-10 line, we leave spaces for defense orders which do not necessarily carry ratings. Any Army or Navy order, whether it carries a rating or not, is a defense order, although it is not necessarily a rated order. The same would apply to the other Government defense agencies—not all Government agencies but those agencies which are specifically listed in the defense definition; the same with foreign Governments and Lend-Lease.

Under "Other Classifications" we have PD-25C. PD-25C form is an extremely troublesome one designed as a part of the original defense supplies rating plan to fill a need for some means of identification which a distributor could use to tell his supplier what kind of business he was doing. It was the only instrument in OPM that considered the distributor in any way, shape, or manner. We have also had the 25D form, which is the specific identification form which has always proved quite troublesome but has also been of considerable value so far. We ask on this line 25 that you fill in the 25C defense dollar volume and the 25C nondefense, and the method of figuring. Next is "All B Ratings." We recognize that B ratings will probably become more and more used and probably become more and more useful. Next is "Known to be non-Defense," that is, you have information on these orders and you know that definitely they are nondefense; and finally, "Defense status undetermined," that is, that part of your volume on which you have no information at all. The total of this part represents the total dollar volume of shipments for the period covered.

End Use of Material Is Important

Part 2, "Classification by Industry or End Use," is the essential civilian needs part. We realize that there are a great many products and a great many producers whose product would not show a very good picture on a purely defense basis, that is, on the basis of rated orders or rated deliveries but whose product is, nevertheless, an essential product for civilian needs. We therefore put in the form a place where you may report to us your shipments by industry or end use.

On a common-sense basis, we want whatever statistics you have available or can get with a reasonable amount of effort. A great many products within themselves define their own end use, so that in very many cases the product itself will determine its own position. We will then have to base our decision as to the assistance we will give a producer of that type of material on the product itself. The basis on which the decision will be made, of course, is in consultation with the proper Industrial Branch and the materials branches.

The final paragraph under the first section of the instructions is: "Preference ratings or allocations authorized will be determined by the importance of the products in relation to Defense and essential civilian needs as evidenced by preference ratings received directing delivery of the products, by the end use of the products, by the types and quantities of materials used in their manufacture, and by such policies as may be established from time to time. In other words, we are not now bound by a purely mechanical method of estimating what to give you. Any decision we make will be cleared through and be made in consultation with the Industrial Branch responsible for the end product. The Production Requirements Plan Branch is simply a service organization. We will administer the policies and decisions that are made by the other branches of WPB.

Section E Shows Materials You Need

Section E is where you begin to list the materials that you require assistance for. Section E is a report of all materials shown on Materials List No. 1 incorporated in products included in Section B. Perhaps three or four or maybe a half a dozen of these materials only apply to your business. From Section E the various materials branches can determine materials inventories and use and total anticipated requirements. If this is carried to a logical conclusion, we have a basis for allocations, however they may be handled.

We ask that you list in this section any and all the materials that go into your product which are included on Materials List No. 1, in the unit in which they appear on Materials List No. 1. We will naturally want quantities here but, again, if you do not keep these materials in quantities we will accept even these materials expressed in dollars.

We also want any materials on the Materials List that you use, whether you have enough on hand for the next three months or not. In other words, if you have two years' supply of a material in your warehouse we want to know it, although you may not need any preference rating system to get material for the next three months.

Packaging Is Shown in Section F

The next section, section F, is other materials incorporated in the finished product included in sec-

tion B, for which preference rating is requested. This section is designed to give you help on fabricated parts, subassemblies, materials which require a preference rating but which are not on the Materials List at the present time; and also in this section are included packaging materials, which has been an orphan and sort of a step-child. We say specifically in the instructions to list in section F "materials used in packaging and shipping the classes of products shown in section B and which are transported with the product * * * if a rating is desired."

This section we want you to fill in in dollars. If you don't have it in dollars, we will take quantities here also, except that in either case we do want an anticipated dollar value of your next quarter's anticipated requirements.

In both section E and F, the total anticipated requirements represent the requirements for your production, regardless of your inventory position; specifically, what you are expecting to chew up within the next three months.

In section G we ask for supplies in one total dollar figure, total maintenance, repair, and operating supplies. We will give you a rating to purchase a certain number of dollars' worth of supplies under this classification. If you get your supplies, operating, maintenance, and repair, through the use of this plan, you may not use P-22; if you do not request supplies on this plan, you can continue to use P-22 to get them. However, most producers will want to get operating supplies under this plan rather than P-22 because it carries a higher rating for the supplies, which will correspond with any higher rating than A-10 which is applied to production materials.

Section H asks for a single figure of an estimated dollar value of the total materials and supplies to be purchased. That is simply an estimate to tell how much of your total purchases are covered on the form, or an estimate of how much you expect to spend in the next three months on these materials.

Certification Procedure

That is the end of the form. Then comes the certification in the customary form. There are two or three points in that certification: "All materials on Materials List No. 1 incorporated or to be incorporated in the products listed in Section B for the periods indicated have been included in Section E." You will certify that you have put in everything you use that is on that Materials List.

"Paragraph (6): 'If preference ratings are assigned under the Production Requirements Plan, no

preference ratings other than those assigned under this Plan will be used by the Applicant to obtain deliveries of production materials, maintenance, repair and operating supplies, unless specific authorization by the Director of Priorities is received through the Production Requirements Plan Section.'" That is a fairly important point: Anyone who operates under the Production Requirements Plan may not use any other preference rating order or any other preference rating certificate to obtain material for his production without specific authorization.

This can be very dangerous. We have cleared this thing with the Army and Navy Munitions Board. They are willing to go along on the assumption that we will be quite liberal where the occasion arises and where a large PD-3 has been served on a producer and he wants to start work, immediately we will authorize him to use PD-3 rating in place of this rating. But we believe that by confining the obtaining of material only to the ratings given under this plan we will also do away with a lot of crossing and overlapping and extensions and a lot of foolish paper work.

In the instructions on the back the last two sections are: "Use of Other Preference Ratings" and "Relief Provisions" and were put at the end and in that order intentionally. A great many producers might think, "I don't think I care much about this rating; I will go along like I have been doing." Therefore, right after the sting we try to withdraw it a little by giving immediately the relief provisions. These are of three kinds. An interim report may be submitted on Form PD-25A to obtain materials not previously authorized; to obtain greater quantities than those previously authorized; or to obtain the assignment of a higher rating. Now these three things we believe will cover the ground pretty well, and we have given specific instructions as to how to proceed to get relief assistance in case it is necessary.

We have also allowed in the form a provision whereby you can apply for a second three months' supply of materials. If your production cycle or your purchasing time is so long that giving a rating for three months in advance is not enough, you may submit an additional PD-25 form, filling in only the total anticipated requirements column, referring only to materials needed for the second quarter. We can give you then a rating on that second quarter's requirements. Then when later you submit your regular PD-25 you fill it in as though we had not given you anything for that particular quarter, fill it in in the regular way, and we will make adjustments, taking into consideration what we have already given you to apply to that particular quarter.

PD-25X

A SIMPLIFIED Production Requirements Plan for manufacturers whose annual volume of business is less than \$100,000 was announced January 27 by the Division of Industry Operations, WPB.

The new plan, to be known as the Modified Production Requirements Plan, is designed to enable the small manufacturer engaged in war or essential civilian production more quickly and easily to obtain priority assistance to meet his needs for scarce materials over a calendar quarter.

Can File for Present Period

Applications will be received immediately under the Modified Production Requirements Plan for the full 3-month period ending March 31. When assistance is granted, the quantities certified will be adjusted to those proper for the remainder of the quarter. At the same time, if desired, manufacturers may apply for their needs for the full quarter ending June 30. They may do this simply by filing a second application for that period along with the first one. Or, they may file

this second application at a later date. Application blanks in a new form, PD-25-X, may be obtained from the small business section of the Production Requirements branch, War Production Board, in Washington, or from the branch offices of the War Production Board in principal cities throughout the country.

One-Page Application Blank

A small manufacturer in applying for priority assistance under this plan is required to fill out only a one-page blank. The information requested will show the nature of his products, volume of business, materials used, number of workers, etc., as indicated by his customary records.

With the application blank, the manufacturer will be furnished a list of raw materials called Materials List No. 2. This is designed to help him in describing and properly reporting the quantities of the various materials he uses and needs to procure.

Form PD-25-X on which this information is to be entered is much simpler and shorter than the Form PD-25A which is used by larger manufacturers under the original Production Requirements Plan.

Also May Report Available Machinery

If a manufacturer is unable to supply all of the information indicated by the application form, he may nevertheless submit his application with such information as he can furnish and the application will be given full consideration.

An added and important feature of the plan is the opportunity it gives an applicant to report the power-driven equipment and machinery in his plant. A copy of the application containing this information will be given to the Division of Industry Operations, which will thus be in position to take such steps as may be possible to employ the equipment for war production.

Special Consideration for Small Business

The Division of Industry Operations recognizes the need for stabilizing employment within these firms as far as it may be possible to do so. Consequently, in weighing applications under the Modified Production Requirements Plan, consideration will be given to the following points: (a) the importance of the product to the war program or the national welfare; (b) the fact that the release of a small quantity of scarce ma-

terials may help maintain a relatively large volume of employment or may free a large amount of available materials otherwise tied up; (c) the disadvantageous purchasing position of some small producers; (d) location of plants in areas certified by the WPB as a distressed area.

It is not intended to maintain non-essential industries when no effort is being made to tie production into the war program. The Division of Industry Operations may, however, be able to give priority assistance to small manufacturers under this plan to help them keep their organizations together while changing to war or other essential work.

Procedure for Application

Each applicant under the plan must fill out five copies of Form PD-25-X. He will retain one copy and send the other four to the small business section, Production Requirements Branch, War Production Board, Washington, D. C. If the priority assistance is granted, a certified copy will be returned to him, specifying the kinds and quantities of materials for the purchase of which he may use the priority rating or ratings assigned to him. Applications for additional priority assistance may be filed during any quarter if the pattern or orders filed by a manufacturer or his volume of business changes substantially during the quarter.

Used by Endorsement on Orders

When priority ratings are assigned on Form PD-25-X, they may be used to obtain the authorized quantities of materials simply by writing a prescribed endorsement on purchase orders signed by a designated official of the applicant company. The rating may be extended by suppliers and subsuppliers of the original applicant to obtain delivery of materials which are to be physically incorporated in the applicant's products. However, manufacturers who operate under this plan may not use any preference ratings other than those authorized on Form PD-25-X, without specific permission from the Director of Priorities, except when they use the A-10 rating assigned by Preference Rating Order P-100 to obtain repair, maintenance, and operating supplies.

The manufacturers who operate under the Modified Production Requirements Plan are subject to the general provisions of Priorities Regulations No. 1.

Metals Study, to Govern Distribution of Critical Materials

THE most detailed statistical study of the metals industries ever undertaken was launched when the War Production Board mailed 10,000 questionnaires to as many manufacturing users of critical scarce materials.

Designed to show for the first time in just what shapes and forms raw materials now flow through the productive mechanism, and to demonstrate how much of each is required for a minimum of essential civilian production, the study will also reveal unimportant uses which are still draining away metals and fabricating facilities.

The Bureau of the Census will tabulate the returns, on the basis of which will be made decisions governing distribution of critical and strategic materials during the calendar quarter beginning April 1.

All returns must be filed with the Census Bureau by February 20.

The form to be used in filing the returns is PD-

275, an adaptation of Form PD-25a, used in connection with the Production Requirements Plan. This will permit manufacturers who will wish to operate under PD-25a to use the same information to fill out both forms.

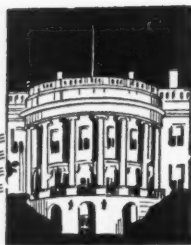
Inventory information called for includes:

Total quantity of material put into production during last quarter of 1941;

Total inventory of all types and sizes on hand, December 31, 1941;

Total quantity of material to be used for production during April, May, and June, 1942 regardless of whether or not the materials are to be purchased or taken from inventory holdings.

Information required on shipments and sales includes the dollar value of the deliveries of each group of products during the calendar quarter, October-December, 1941; breakdown by rated and unrated orders, and estimated total shipments to be made during the calendar quarter, April-June, 1942.



Washington Letter

Some Changes in Equipment Buying Procedure

IN the very near future the Army will be in the market for approximately 40,000 furnaces, according to usually reliable, but unofficial sources. Apparently these furnaces will chiefly burn coal and wood, and will have blowers for forced warm-air circulation in the shelters to be built in 21 prospective cantonments. These cantonments collectively will domicile 1,000,000 men, an average of 45,000 to each cantonment.

Where the cantonments will be built is naturally a military secret. Exact location of places, exact quantities in specified projects, and any other exact specifications are not published. The facts will be available to qualified bidders almost immediately. Those who keep in touch with Army sources in their own regions and sections, as well as in Washington, will be able to secure all necessary details. The whole complement of cantonments is planned to be completed, ready for occupancy by Fall.

How Army Intends to Buy

Under the general direction of Assistant Secretary of War Patterson, the Army negotiates its own Procurement with the assistance of men of the staff of the Division of Purchases of the War Production Board. Actual building is done under the direction of the Corps of Engineers. The Engineers have their own Procurement section which integrates with the general Procurement organization of the Army. Most of the contracts will be negotiated without advertising or the usual competitive bidding. Contracts will be given to those manufacturers judged most competent to deliver the goods.

While building construction will be done by prime contractors, acting virtually as agents for the Army, the actual purchase of the furnaces, and similar equipment, will be negotiated on the mass-buying principle. The actual installation work, when not part of the purchase contract, will be performed under the prime contractor, by local subcontractors. Purchases and contracts for installation will be negotiated almost wholly on the basis of cost-plus-fixed-fee. Under Executive Order 9001 the fixed fee usually will be limited to 7%.

Usually full information can be had from the District Engineer or Regional Engineer of the Corps of Engineers. There is a Regional Office in each of the twelve regions and many more District Offices. Any Army headquarters at any existing camp, or in any city, can tell you where to find the Corps of Engineers offices. If you have any real difficulty about finding the offices, write to The Editor of American Artisan and the information will be forwarded to you from the proper office in Washington.

The WPB, successor of OPM, has consolidated all OPM field activities under a Bureau of Field Operations, headed by L. Edward Scriven who formerly was head of the OPM Priorities Field Offices. The 45 field offices of the Priorities Division have been consolidated with the 113 offices of the Division of Contract Distribution. Other field activities also will be merged with these offices. It will thus be possible to find all field activities of WPB at the same place. In effect, wherever you are located, you should now be able to find the source of authentic, first-hand information within easy access by telephone or by visit.

Under the Nelson regime, the people in the field will be constantly in touch with the heads of their various Divisions, and will be able to give you real information with as much authority as if you were to call at headquarters in Washington. The field people will frequently come to Washington to go to "school," which means they will be kept strictly up-to-date about the shifts and changes that constantly must occur under the condition of War. There is every reason to believe this system will really solve many problems that now beset the people spread widely over the vast expanse of the United States.

Some Confusion Is Being Removed

It is hoped that the confusion and bewilderment which has hitherto characterized the atmosphere in Washington will gradually give way to order and definition and more assurance. Washington headquarters offices apparently will function on the major problems, the national and international complexities, while the field offices will settle the questions that have to do with the problems that come up in the various localities. Priorities connected with building in defense areas will largely be settled wherever they occur.

Under present arrangement you make application for any preferred Priority rating you may need in the nearest FHA office. Your application is prepared with the help of the WPB lawyer, WPB architect and WPB engineer. It is not an FHA transaction. Until the merger of WPB field offices is completed, the Office of Defense Housing Coordinator simply uses the facilities of the FHA offices.

Defense housing in defense areas (built with public funds) is placed under a blanket priority rating which is determined in Washington, after the urgency of the job is rated in its relation to the location, and the relation of the project to the urgency of other projects. The rating of priority preferences for defense housing built under private financing is fixed in the field without reference to Washington unless there is some extraordinary problem.

The same process is used to give priority ratings to projects for repairs and maintenance, and for rehabilitation. As a rule new housing is given preference over repairs and maintenance; and repairs and maintenance is given preference over rehabilitation. It is usually assumed new houses are urgently needed to take care of workers requiring immediate shelter. Repairs and maintenance presumes that a dwelling used for defense workers is in such condition that something must be fixed or replaced swiftly to maintain the place in habitable shape. Rehabilitation is regarded as the adjustment of a dwelling so that it may be made useful for a larger number than are already living in it.

There is apparent confusion about priority certificates (an A-10, for instance), bringing swifter service in one instance than in another. The reason may be due to several causes. It is explained that a group of dwellings in one block with A-10 ratings may secure supplies more easily than a similar group in another block nearby, because the first block may be dealing with a supplier upon whom there is no demand backed by a higher rating.

(Continued on page 98)

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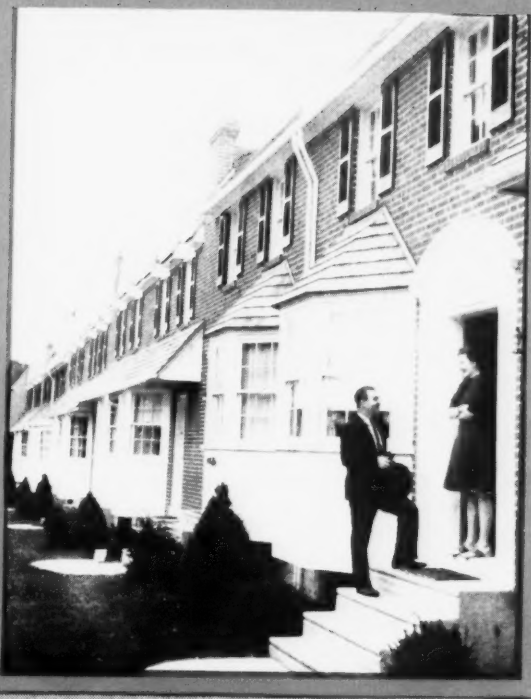
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, 1942

AMERICAN ARTISAN

RESIDENTIAL AIR CONDITIONING

S E C T I O N



DEVOTED TO HOME AND SMALL COMMERCIAL AIR CONDITIONING

Sure WE'RE MAKING CONTROLS!

WE ARE MAKING THEM and shipping them to you in the heating business just as fast as the supply of materials and the limitations imposed by priorities will allow.

Production of other precision instruments for the army, navy and air corps is *not* interfering with, and has not interrupted, the manufacture of our regular lines — and, in order to *continue* to avoid interference with our regular production, four floors are being added to one wing of our present building to provide facilities for handling the increased demand for military equipment.

Since automatic controls are essential to many phases of the war program and those needs must be met first, we believe that it is the duty of our industry

to comply rigidly with the spirit as well as the letter of the law. So if you can't get all the M-H controls you want when you want them, remember: 1. Only influences beyond the control of *any* manufacturer prevent us from making normal deliveries . . . but priorities are often available and expedite shipments. 2. Minneapolis-Honeywell has ample manufacturing facilities and is able to secure such materials as are available. 3. M-H consumer advertising is working for you now and is building a future market for automatic heating. 4. M-H controls are helping you by helping to meet the National Emergency. Minneapolis-Honeywell Regulator Company, 2726 Fourth Avenue South, Minneapolis, Minnesota. Company owned branches in 49 principal cities.

MINNEAPOLIS-HONEYWELL
Regulator Company

What Can the Heating Contractor Do Now and in the Future?*

By S. Konzo

Special Research Associate Professor
Engineering Experiment Station, University of Illinois

STRENUOUS times demand strenuous action. I have been invited here tonight to discuss some measures which we as patriotic citizens can do to maintain an essential industry. Make no mistake about it, heating is as essential as clothing and shelter. The morale and efficiency of the nation cannot be maintained at peak level in cold underheated rooms. In one sense we are fortunate in that we deal with a form of heating that is ideally suited to the requirements of the day. Both the gravity warm-air and forced warm-air systems are simple, direct, efficient, and economical of materials and fuel. In this brief discussion the objective will be: "What Can the Heating Contractor Do Now and in the Future?"

He can do many things. First of all what are the building prospects, on which his own business depends? We can expect the following types of construction:

a) Large scale army camp expansion. Forced air heating systems have been specified in the posts. Unless the industry is ready to present its case forcefully as it has in the past, we have no assurance that the new program will utilize the same system.

b) Concentrated housing programs at overcrowded defense areas. This will be under the F. W. A. and will be small house units employing 26 by 26 in. PBA-18 defense units.

c) Private residence construction of small size, primarily in defense areas.

d) Replacement and repair work everywhere.

e) Factory, store and office heating, many of rush nature.

Now let us see how you can fit into this construction picture. In the first place the number of contractors who can handle large scale army camp or defense housing installations is rather limited. May I suggest that some of the smaller contractors pool their resources and enter the competition in some of the larger developments.

To the vast majority of contractors will fall the tremendous task of keeping a business together in the face of a decreasing supply. I would like to offer the following suggestions as a guide to follow in the days to come:

*Briefed address delivered at the meeting of the Central Committee for sheet metal and furnace contractors, Chicago, Dec. 29, 1941.

1. Be Ready to Switch to Substitutes for Sheet Metal

a) Commercial products are now available and recommended for panning of return air joists.

b) Manufacturers of such products should try to obtain underwriters' approval for possible use in warm air ducts.

c) Sheet metal worker's unions should secure a clear cut decision as to their right to work with such materials.

d) Clips or fasteners should be devised so that such materials can be easily assembled.

e) Be ready if necessary to use painted black iron sheets. Experiment now with paints and be ready if it becomes necessary.

f) Investigate building codes to see whether such substitutions will be permissible. If not see what can be done as an emergency measure.

g) Bricked up furnace casings may be used in some cases to eliminate metal casings.

2. Reduce Materials in Small Homes

a) Use shorter, more streamlined returns.

b) Use fewer number of returns of larger capacity.

c) Use inside wall returns when practical.

d) Use lighter metal grilles rather than heavy castings for grilles. Consider possibility of return to wooden grilles.

e) Use baseboard warm air registers if material requirement is smaller.

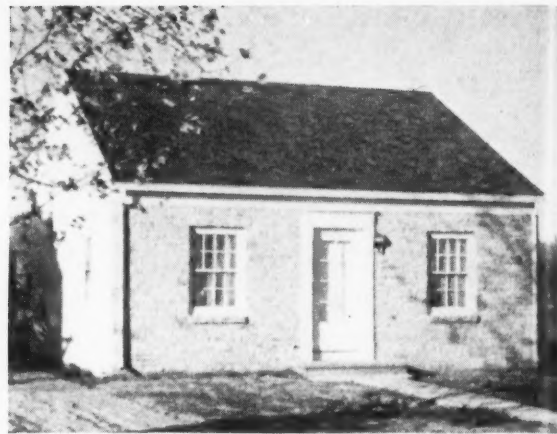
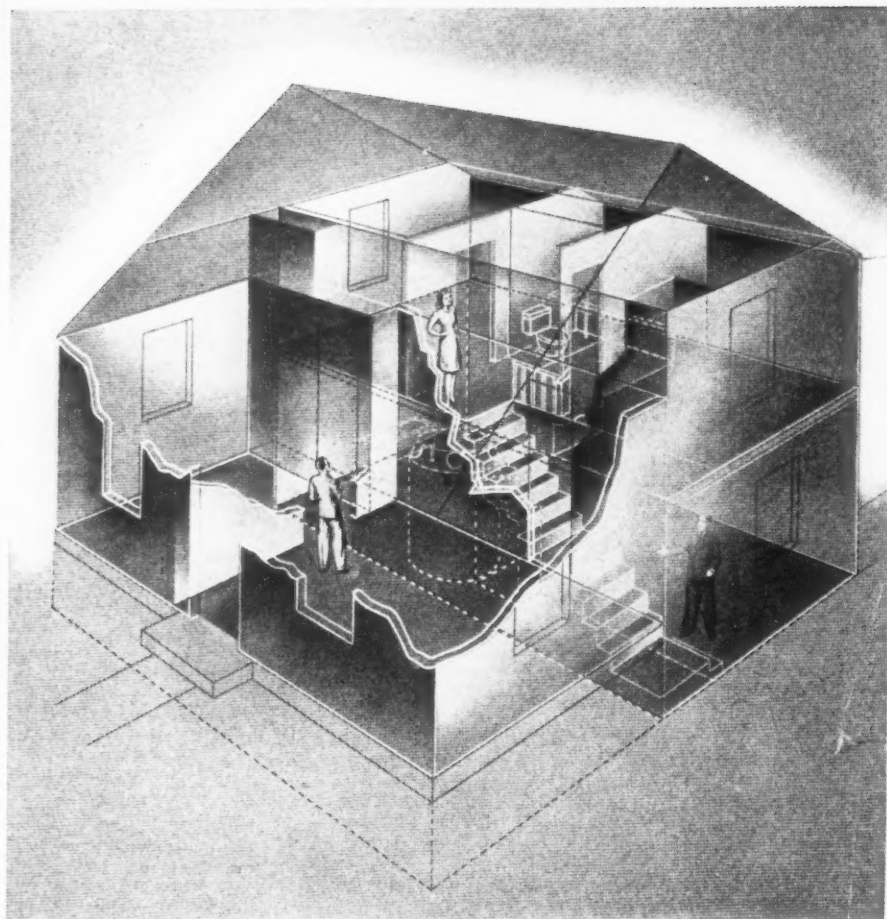
f) It is not necessary to sacrifice heating results. In fact any material used which does not fulfill its function is a waste of material. Now even more than before we must have maximum results with minimum expenditure of materials.

3. Repair and Replace Existing Plants

a) The Plumbing and Heating Advisory Committee of W.P.B. is giving this matter serious attention, since heating plants are essential to the health of the nation. The latest report from the office of the N. W. A. H. & A. C. Ass'n indicates that an order dealing with repairs and replacements should be soon forthcoming.

b) Periodic checking of all heating plants is urgently required.

c) Use fire cement for lining firepots to
(Continued on page 102)



[*Defense House Heating*] Tri-Level Houses

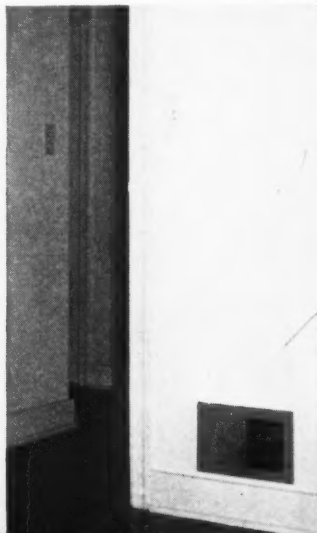
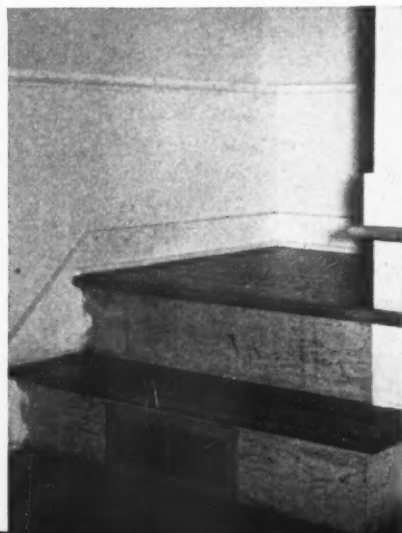
AN interesting type of low cost, small home which is finding unusually favorable acceptance in some eighty cities is shown in the accompanying photographs and drawings. Known as the Tri-Level Home and protected by U. S. Government copyright, Walt B. DeGree of the Cooke Construction Company of Detroit, holder of the copyright, has issued a licensing agreement and franchise to builders to erect these houses. In Detroit four local licensees have erected some 300 houses.

In Madison, Wisconsin, the O. & N. Construction Co. has built some 15 of these houses. The photographs were taken in Madison where Reinick and Krueger, local warm air heating contrac-

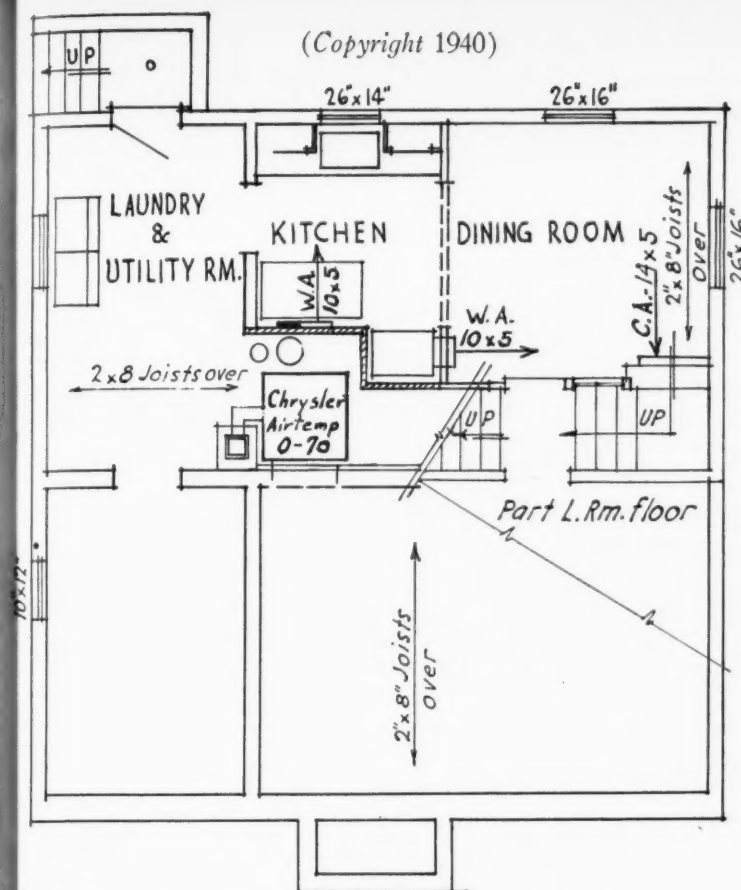
tors, have installed oil-burning, forced air, high-boy furnaces in these houses.

The chief appeal of the Tri-Level house is one-third more living space—large living room, dining room, kitchen, bath, 250 sq. ft. utility room, three bed rooms—for each dollar, in a shell no larger than the average four-room one-story and basement house. As the photographs show, the front eave is about 11 feet above grade; the ridge about 18 feet above grade, with 8½ feet headroom in the basement, 8 feet on the first level and 7½ feet on the third level. The sub-grade "basement" floor is only 2½ feet below grade and is as well lighted as upstairs.

As the plans show, the forced warm air furnace



Above—Isometric sketch showing floor levels and furnace and the exterior of a Madison house (front and rear). Left—In center a directional flow warm air register and two returns (see plans opposite).

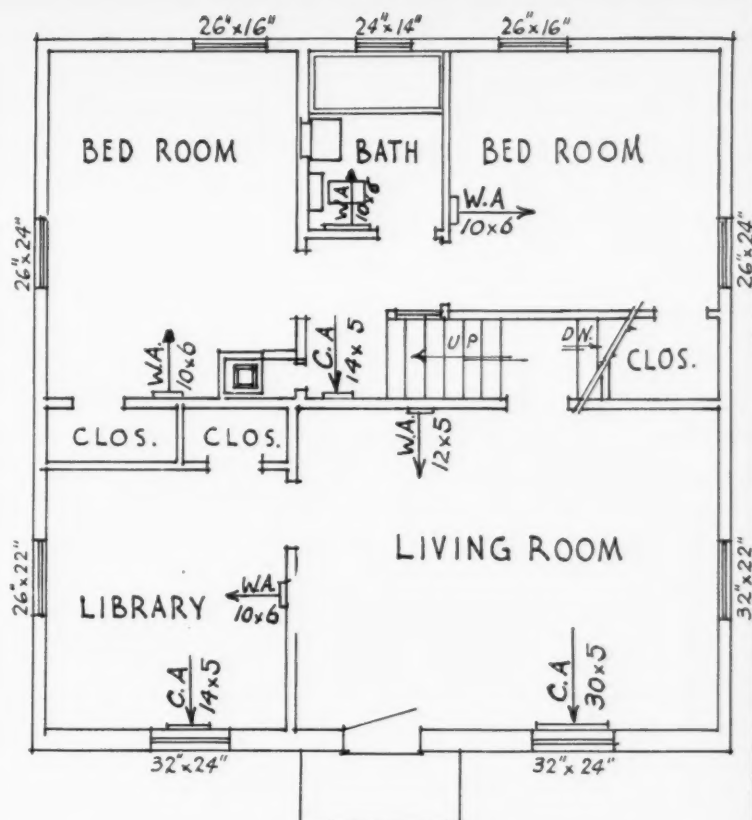


FOUNDATION AND SUB-GRADE PLAN

is located in a heater alcove in the basement utility room with high side wall registers (above the top of the furnace) supplying dining room and kitchen. Warm air registers for the first level (living room and bedroom) are just above the baseboard; registers in the second floor bedrooms are also just above the baseboard.

Return air is taken through the lowest riser in the stair leading up from dining room (see photograph) and from outside wall locations in the living room and library—total of four returns.

The result is a very compact duct system with fairly short stacks and branches with cost further reduced through the use of round pipes or continued stack for supply and return. Two-way,

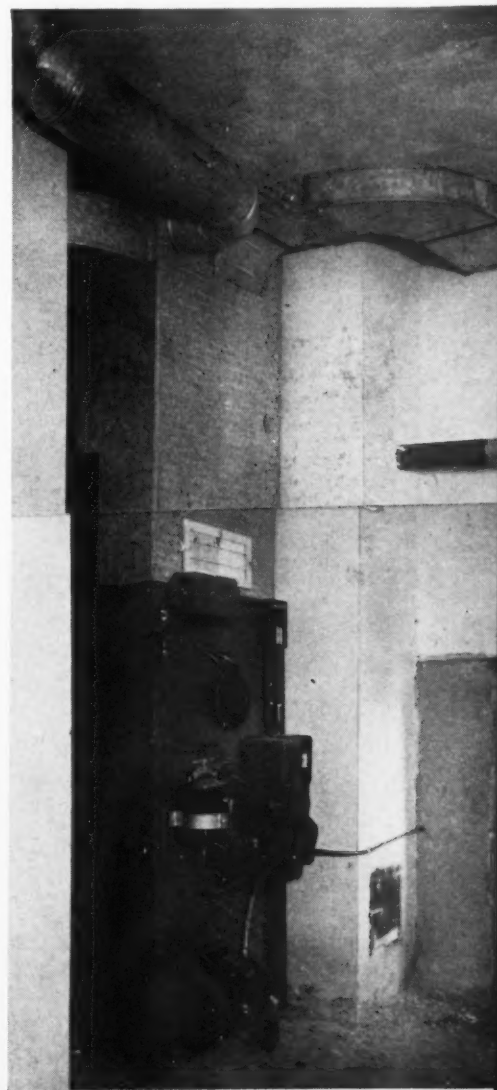
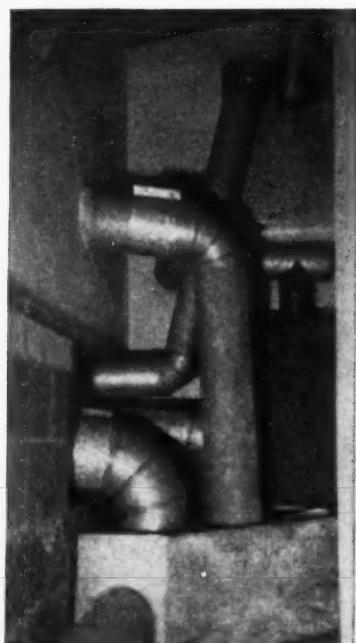
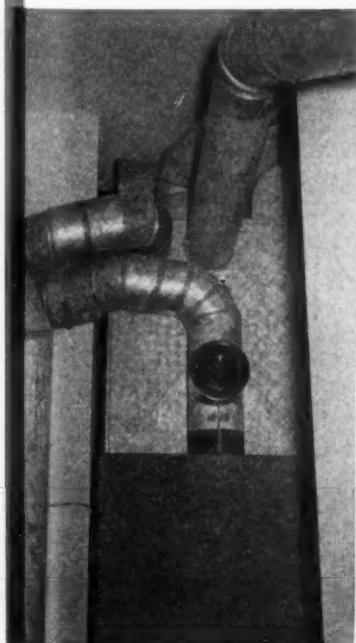


FIRST AND SECOND FLOOR PLAN

directional flow registers are used.

Architect W. B. DeGree, designer of the Tri-Level house and Vice-President of Cooke Construction Company, reports that in the various cities coal, oil and gas furnaces have been used with coal, manually fired in a gravity furnace,

(Continued on
page 52)



Simplification is the Key to Wampler's 1,500 Installations in Philadelphia Homes

IN and around the city of Philadelphia, where the factories have been humming day and night with orders for the Victory program and the shipyards have been racing far ahead of schedules which were crazy-fast to start with, the building trades have worked at no less speed on low-cost housing projects to care for the tens of thousands of workers for whom no homes were previously available. The year 1941 has given the builders and the heating contractors as crazy a race against time as can be conceived.

Such feverish activity tries men and methods to the utmost, but out of such maelstroms come new and better methods—increased speed and accuracy, lowered costs. That is what happened last year in Philadelphia, where the H. F. Wampler Company developed a system of prefabrication and installation which has given 1,500 Philadelphia defense workers the best in winter air-conditioning at prices which enabled three-room homes to sell for as low as \$3,990.

The Wampler methods, outlined in this article, are not only the secret of his success, but the secret of his 10-year reputation among Philadelphia builders, who sum it all up in the phrase: "Wampler is hard to beat."

The first step in the Wampler program of cutting cost without affecting quality is the almost complete elimination of sales costs. No sales staff has been maintained for the last five years

and all jobs are secured through estimates supplied on request of builders themselves. Wampler and his general manager, D. K. Smith, do all estimating and their expenses are the only "sales charges" which must eventually be absorbed by the home owner.

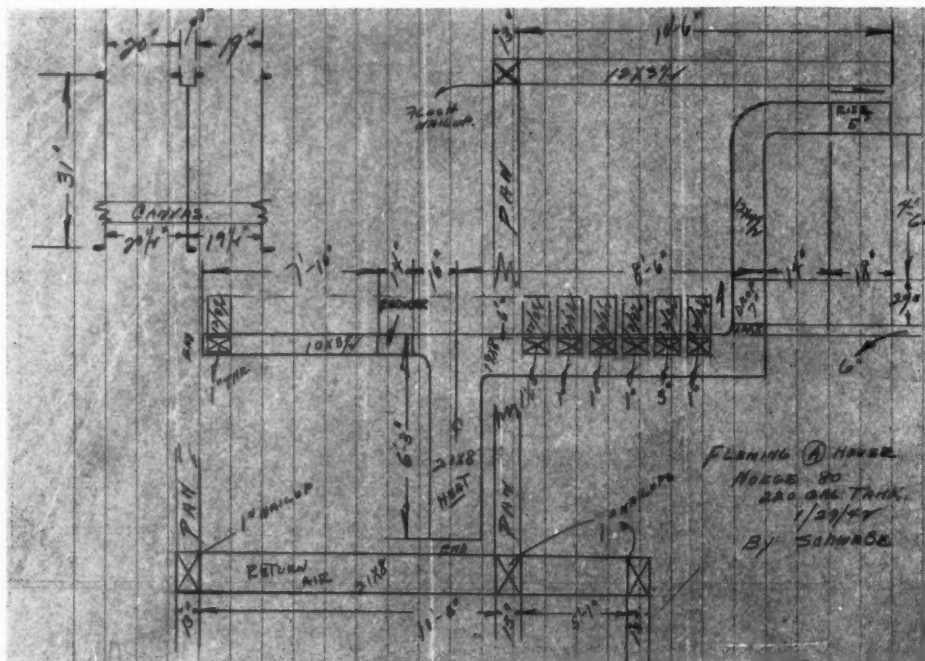
Eliminates All Possible Paper Work

The real economies begin with the elimination of almost all the "paper-work" which so many contractors believe is a necessity. This lesson, one of the most important, was learned the hard way. In early years, expensive and time-consuming engineering layouts were made, presented and approved.

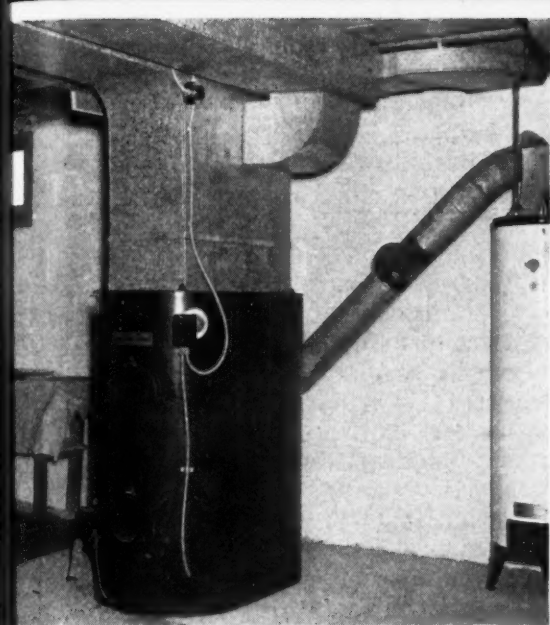
The payoff was almost always the same: because of construction difficulties and last-minute changes, the risers practically never could go where the engineering layouts had designated.

Today the engineering layout has been eliminated. First paper-work is on the builders plan itself, where the number of outlets per room is marked. Heat loss is then figured on per-room basis and the "critical" room of the home is carefully checked for the possible necessity of two outlets.

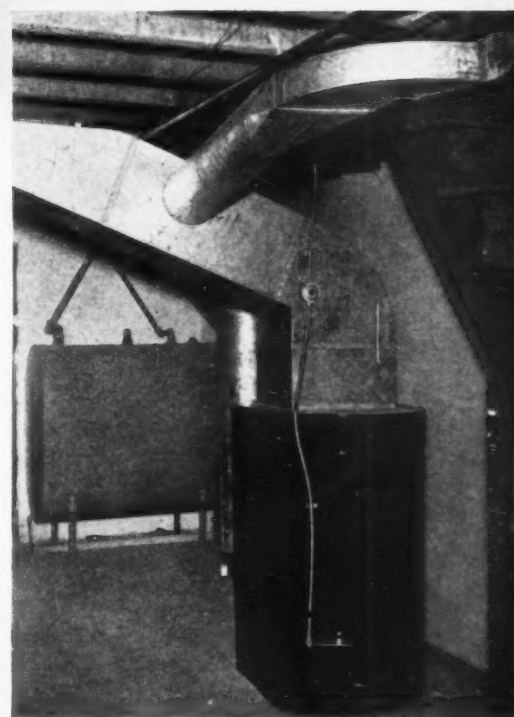
Standardization in gravity work with standard 12 by 3½-inch risers and 12 by 8-inch registers and in forced-air work with same risers but with



On a single piece of yellow paper Wampler's superintendent makes a sketch like this from job measurements, indicating all fittings and pipe sections; also base measurements for filling in straight sections. The sketch is reproduced and used by the shop, field crews, engineers, etc.



Upper left—Lafayette Hills homes built by Jas. Stewart & Son (forced air, oil-fired). Upper right—Marlton Manor (gravity, oil-fired). Center, left—Crescent Housing Corp., Belmawr, N. J. (forced air, oil-fired furnace with typical Wampler duct work). Center, right—John H. McClatchy Co. built 196 row houses in Upper Darby using one of these gravity, oil-fired furnaces in each unit. Lower, left—Earl R. Lippencott Co. built 50 row houses like this in Audubon (forced air, oil-fired). Lower, right—Some of 200 single family houses built by Crescent Housing Corp. in Belmawr (forced air, oil-fired).



12 by 6-inch registers has eliminated costly special figuring and done away with many of the special engineering problems which required the preparation of the usual engineering layout. Almost complete standardization on the heating units themselves has been reached with selection of Norge Warm-Air Conditioning units manufactured by Norge Heating and Conditioning Division, of Borg-Warner Corporation at Detroit. No special fittings are necessary. Oversize can be easily controlled with dampers. Complete satisfaction on the part of home owners with the results obtained has been the indisputable proof of the pudding.

For the costly paper-work which has been eliminated is substituted close and frequent personal

contact with the builder during all stages of construction.

Everything "Outside" Done by Crews

First step in this program is immediate contact with the builder's foreman by the Wampler field superintendent who visits the job in person and goes over the builder's plan, on which number of outlets per room has previously been marked. Jointly, the two of them reach agreement on location of risers and registers and this information is then marked on the plan with crayon. Material is delivered to the job by the Wampler truck on the same day.

The following morning a two-man roughing-in



All duct work for one complete house system is fabricated as a job, then the complete duct system is put in a truck and taken to the house.

crew does all rough-in work for pipes, boxes and boots.

Immediately thereafter, the tank and unit crew installs tank, all oil piping and the fill and vent lines. The unit itself is then installed by the same crew. The Norge OA-63 is used for the majority of forced-air jobs and the OB-60 for the greater proportion of gravity installations.

Because of the vital part which shop pre-fabrication plays in the Wampler plan, measurements for duct work are taken personally by Wampler's superintendent. These are returned to the shop and made up in manifold on a special form illustrated elsewhere in this article. Paper work is then introduced and used with great care at the one point in the entire operation where it is essential to good engineering and successful

results. As may be noted, no paper-work has been introduced in the stages where builders' changes might have invalidated it and required costly re-preparation of material.

The first copy of the measurement sheet, all copies are numbered, is delivered to the Wampler shop foreman, Irvin Ramsay.

In the shop, processing of sheet metal has been worked out to such a point that, while accuracy is maintained to the highest standards, complete duct-work jobs leave the "production line" on an average of ten per day.

Although limited in size, shop layout is planned for orderly movement of material, ample working space for the men and a minimum of "backtrack" in routing.

Shop Work Specialized

Layout is immediately followed by scribing from pattern prepared from superintendent's figures taken on location. Operations on squaring shear, Pittsburgh machine and 8-ft. brake are followed on the bench by scribing of reverse side. Edging on the edger, fabricating and spotwelding follow in quick succession. The work is highly specialized and the standardization of both parts and methods enables the men to acquire a facility in the work which is notably lacking in the typical "specially engineered" operations.

Each piece on the plan prepared from the superintendent's measurements of the job is given a number when the plan is prepared and this number is placed on the piece itself as it is processed in the shop.

A copy of the plan, with these piece numbers appearing, is given to the erection crew. Consisting of two mechanics and a helper, this crew then proceeds to the building location where material



The smiling young lady receives service calls, also calls to "start up" the plant when a job is finished. These calls are classified and assigned by W. A. Farrell using this "pigeon hole" to indicate urgency, or service man assigned to the call, or by routing. Three hours is claimed the maximum time required for any call. Night calls are automatically routed to the home of the service manager who dispatches his men.

for the job has been trucked from the fabricating shop.

As soon as installation of cellar work has been completed by the erection crew (Note that these duct-men are never required to work on the units), an inspection of the entire job is made by Wampler's assistant outside superintendent. Any corrections or adjustments which are found necessary are taken care of at once so that they never concern the service-man sent to "start-up."

The "start-up" operation is performed within not more than three hours from the time the builder advises that oil and power have been supplied and that he desires heat in the building.

Prompt Service Is Featured

Promptness in handling these calls is a result of efficiency of the entire service system which has been developed by Wampler with the cooperation of Wm. K. Farrell of the Farrell-Wampler Company, an affiliate organization handling the sale of fuel oil. Taken by a specially-trained young woman on the Wampler switchboard, the calls are filed at once in a pigeon-hole case arranged to classify all calls as to their urgency, location, assignment to particular service man and final disposition. "Forgotten" or neglected calls cannot occur under the system. The customer good-will resulting from this careful attention to service work has reflected itself in commendation by home owners to builders, with resulting benefits to Wampler. It is one of the factors which have gone far to eliminate the necessity of costly sales effort on the building trade.

A brief resume of some of the major projects in which installations were made during 1940 are of interest in giving a full background to the picture.

One of the major developments was that of the John H. McClatchy Co., who erected 196 3-bedroom row houses to sell at \$3,990 in the McClatchy sub-



Above—Spot welding of fittings is standard Wampler procedure. Standardization of all fittings enables the shop to produce for stock. Below—Fittings are scribed from standard patterns and put through power machines. Foreman Irvin Ramsey checks a pattern.

division in Upper Darby. (See Residential Air Conditioning Section cover photograph.) Of the gravity type, with Norge OB-60 unit, these installations utilized a simplified duct system with, plethum going to 2nd floor joists. Special 220-gallon tanks, designed to Wampler specifications, were necessary to fit limited basement space while maintaining required distance from unit.

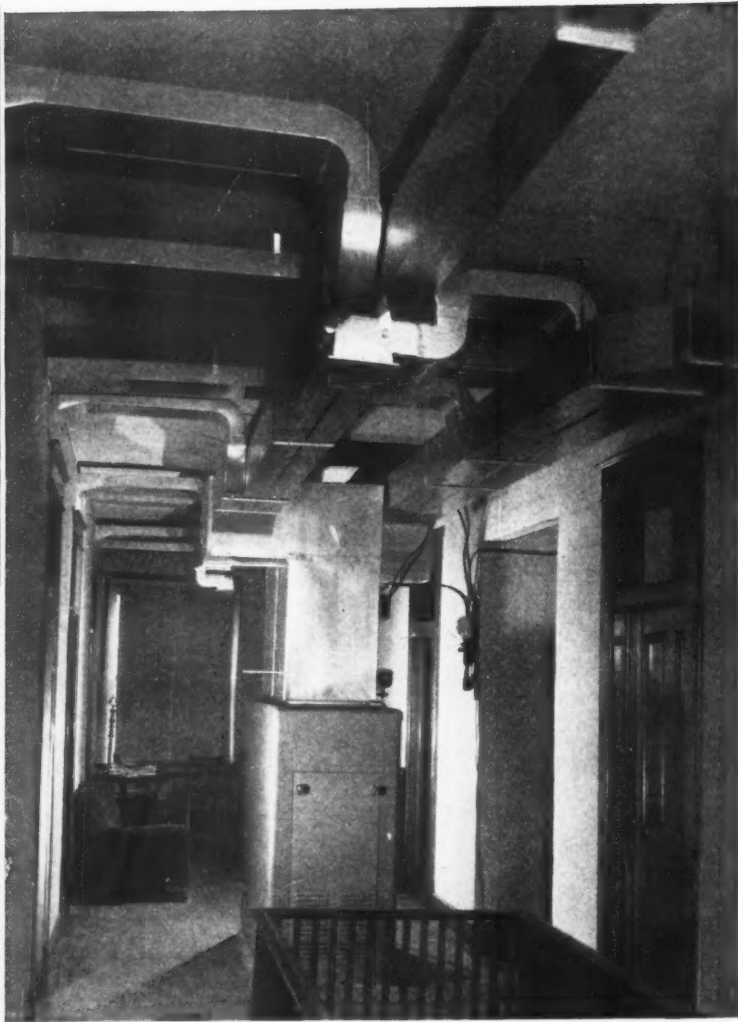
In the Glen View Subdivision, near the Marcus Hook locations of the Sun Shipbuilding Company, 87 two-to-three bedroom homes were erected by the Media Construction Company. Heating contracts went to Wampler. In these installations, a Wampler-developed gravity trunk line system with Norge OB-60 was used for the two-bedroom homes and a forced system with Norge OA-63 for the three-bedroom units. The homes sold from \$4,335 up.

Two hundred homes in nearby Belmawr, N. J., constructed by the Crescent Housing Corporation, utilized forced air systems with the Norge OA-63, as did 50 others in Earl R. Lippincott's Audubon section. Selling price was in the neighborhood of \$4,450.

One of the most interesting jobs was that for Marlton Manor Homes, each unit containing 10 single homes with two duplex on each end. The Norge OB-60 was used, gravity system, with two units to serve each duplex and one for each single.



Furnaces in the Second Floor Halls of a Rehabilitated Hotel



MANY years ago, so many that citizens can't remember, there was built in Frankfort, Indiana, a hotel building, two stories high, 14-inch load bearing brick walls, second floor substantially as shown in the second floor plan. The first heating equipment was first floor stoves with bedrooms cold. Then two coal-burning, gravity furnaces were installed and warm air pipes were run to a few bedrooms and the second floor halls. The hotel was, during this period, mostly a stop over for railroad men on their runs.

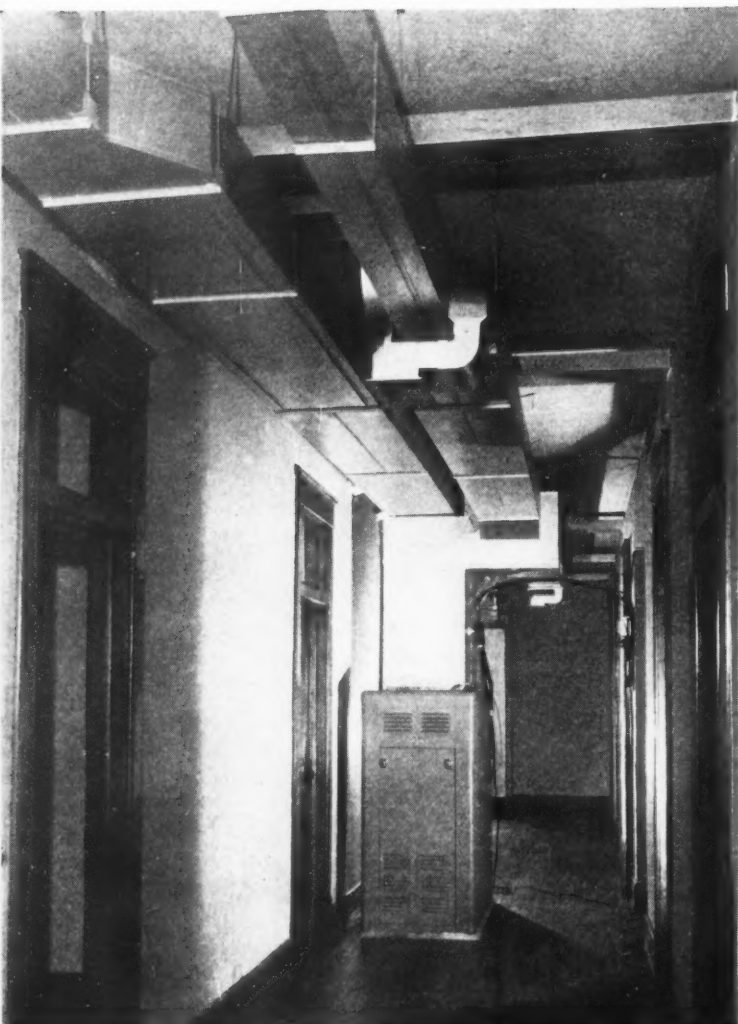
Then for some years the building was unoccupied or was used spasmodically as storage. About three years ago Mrs. Pearl Myers leased the building and began to renovate the rooms and building to provide a profitable hotel for railroad men and transients. Adequate heating was essential, but the problem of getting heat in the leased building at a price which permitted profit was not too easy.

Mrs. Myers considered a basement steam boiler with radiation in the rooms—but the cost was much too high to permit profitable operation, and would have necessitated reconstruction of the basement. Twin basement, coal-burning, forced warm air furnaces were also considered, but cost of firing, cost of installing stacks and ducts through the old structure made the final cost of this system too high for profit.

Furthermore, in both these systems the equipment could not be removed if Mrs. Myers decided to give up her lease and she wanted, if available, something which could be moved.

At this point F. P. Graham, Frankfort Premier warm air dealer, suggested that automatically fired, forced warm air furnaces could be placed in the halls of the second floor with duct work running down the halls—the effect might not be artistic but would not be unsightly. Automatic firing would eliminate an attendant. Duct work would be simple and of a minimum quantity. Installation would be simple and almost no cutting would be necessary. Most important of all from Mrs. Myers' viewpoint, if necessary, the entire installation could be removed with the exception of the return stacks in the hall partitions. Lastly, oil was recommended over gas because in Frankfort oil is cheaper to fire.

Mrs. Myers bought Mr. Graham's plan. Mrs.



Myers' only first floor space is a tavern and to heat this one of the basement gravity furnaces was converted. The other first floor space is rented by stores and each tenant furnishes his own heat.

Two furnaces and two duct systems, as shown in the photographs and the drawings, were installed. The furnaces are on a foundation of 1/4-inch asbestos mill board and the furnace body stands 6 inches off the floor on legs inside the casing, so local fire laws were satisfactorily met. The furnaces are Premier RX 8's, 117,600 Btu output.

One furnace serves the south half; the second furnace serves the north half of the floor. Mains and return mains were run two ways from the extended plenums with piping supported on 16-inch centers by hangers screwed to the ceiling joists. Branches run a few inches below the ceiling to the hall-bedroom partition and connect to two-way 22-degree (right and left and down) registers without any drop in the partition. The throw is about 13 feet. Ten by 6 and 12 by 6 registers were used in all rooms except bedroom 1A which has a 14 by 6 register.

Returns (see plan) were placed in the baseboard with stacks up to the return branches a few inches below the ceiling. Cutting for the stacks and the registers or grilles was the only building alteration required.

Since Mr. Graham has a small shop and is not equipped to do large sheet metal contracts, Lam-neck pre-fabricated ducts were used throughout. Mr. Graham has used considerable pre-fabricated

duct work and to avoid waste sections and reduce cutting and fitting he makes a point of carefully measuring all pipe work layout on the job so that rough in and hanging fits. On this installation the straight up plenums were made up in the Graham shop. The cost, according to Mr. Graham, is less than shop fabricated under his particular shop conditions.

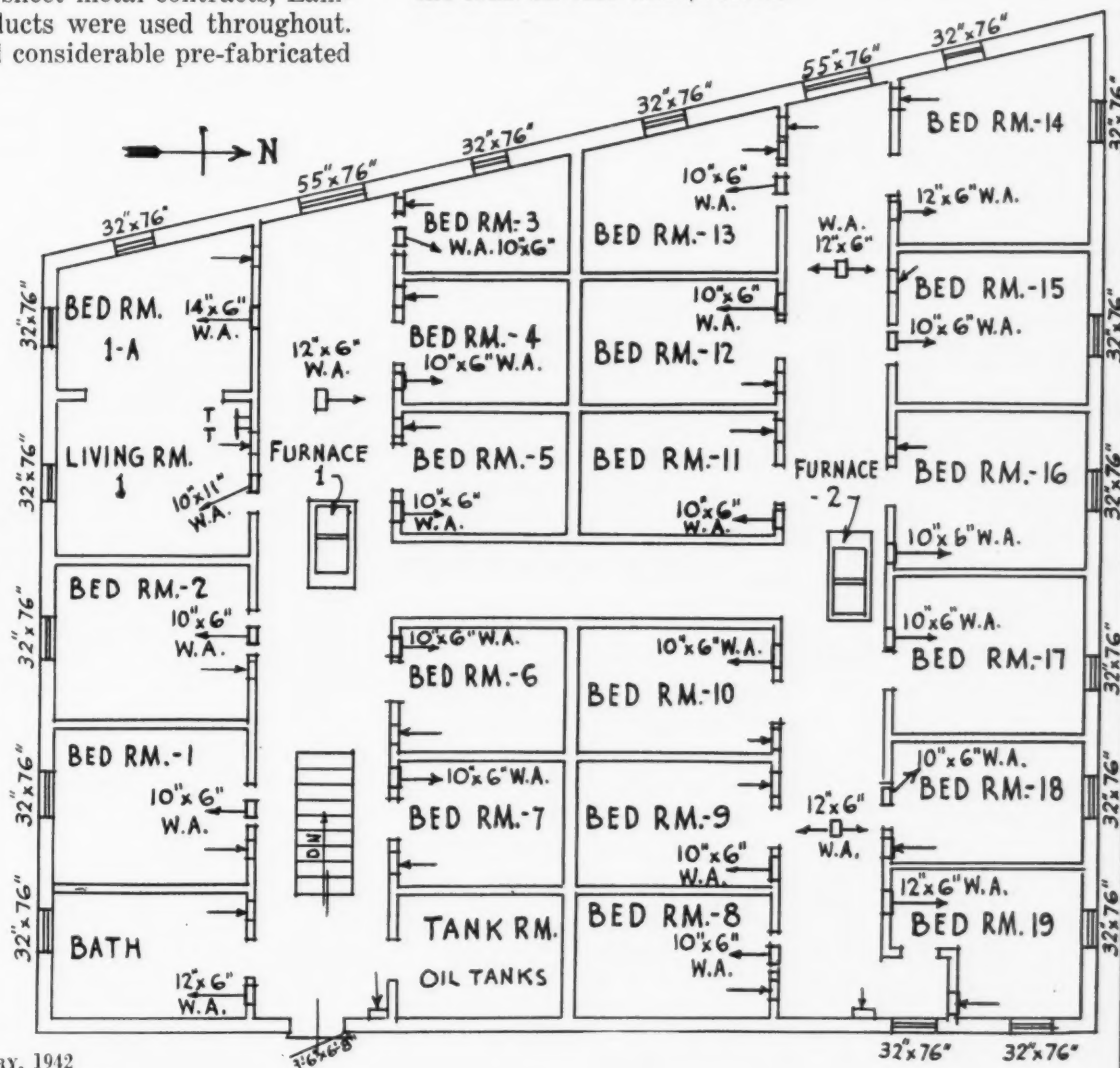
As the plan shows, the bedrooms vary somewhat in size and the room heat losses, accordingly, range from 14,770 for room 14 to 6,510 for room 18 for outside rooms and from 7,630 for room 13 to 2,250 for room 5 for inside rooms. The total heat loss on furnace number 1 is 86,170 Btu and 102,370 Btu on furnace number 2. Cfm. on furnace number 1 is 1,123 and 1,326 on furnace number 2.

Of interest is the location of both thermostats in Mrs. Myers quarters (living room) so to meet the greater heat loss and exposure of the north rooms the thermostat for north rooms is usually set one or two degrees higher. In both halves the heat loss was figured for 70 degrees to zero.

Incidentally, the halls are heated by drop registers as shown in the photographs and the halls have 20,830 Btu loss in the north hall and 27,300 Btu loss in the larger south hall.

The oil burners were set at 1.2 gallons per hour and use number 3 oil which cost last winter an average of 7.7 cents per gallon. Fuel costs were carefully recorded and for the 1940-1941 winter the total oil cost was \$145.00.

On facing page—The two furnaces and their pre-fabricated duct systems. Note straight out supply branches with flare to registers; also flat returns which connect to stacks. Right—Plan of second floor showing rooms, furnaces, registers and returns. Total heat loss—188,000 Btu.



Rudiments of Small Stoker Operation [Part 3]

By S. H. Viall

Chief Combustion Engineer
Chicago, Wilmington & Franklin Coal Company

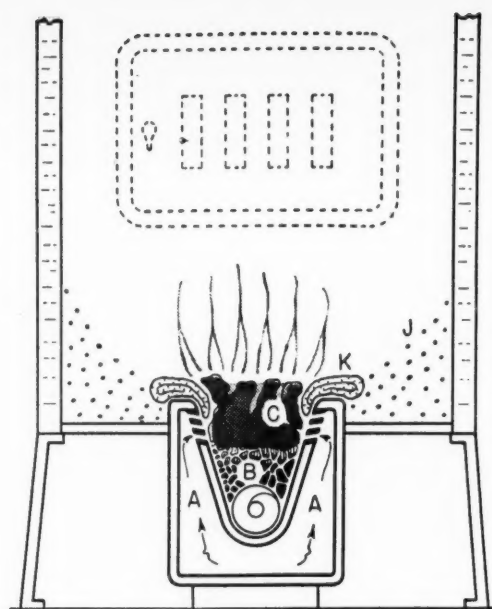
This article is one of a series of copyrighted articles published in *The Rescreener*, house organ of the Chicago, Wilmington & Franklin Coal Company, under the title—"Along the Firing Line." The articles are, we think, about the simplest, easy-to-understand discussions of small stoker operating problems in the long list of published material on stoker firing.

CARBON and hydrogen are the materials in fuel that produce heat when chemically combined with oxygen from the air. They combine in definite proportions: two atoms (units) of oxygen with one of carbon, and one atom of oxygen with two of hydrogen. Any additional oxygen is surplus. In practice it is desirable to provide a *small* surplus of oxygen (air) to be certain of supplying enough, but too much surplus air is wasteful, because it carries up the chimney the heat used in raising its temperature to that of the other chimney gases. As much as fifty per cent of the heat value in a fuel can be wasted this way.

Increasing the rate of air supply to a fire increases the rate at which the fuel burns. Only a few people appreciate that a fire may appear to be very hot and vigorous but at the same time have a large excess amount of air passing through it.

The amount of heat lost to excess air varies with the design of the plant, rate of burning, skill of operation, attention given, and other factors. In skillfully operated, carefully and constantly attended modern power plants about 15 per cent of the heat developed is lost up the chimney; about 25 to 30 per cent is lost in many well operated, small industrial plants. In semi-industrial and domestic heating plants, where less thought, time and attention are given to the fire the heat lost to the chimney may exceed 50 per cent. Because excess air has such an important effect upon the amount of coal used, and on satisfactory stoker performance, stoker owners and operators can save time and money by learning how to keep excess air within reasonable limits.

Automobile drivers know that they cannot get good performance from their cars when the carburetor supplies excess air. Only a few persons



LEGEND -

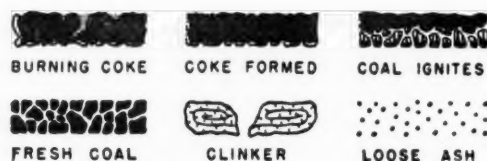


Figure 11. Cross-section of retort and fire showing fan supplying air through tuyeres at A, feed screw supplying coal at B, and coal burning at C.

recognize that the same is true with stokers. Too much air produces a lean mixture that wastes coal and is the most common cause of calls for service on small stokers. Frequently the air supplied is ample to burn 40 to 100 per cent more coal than the stoker is feeding. In such cases the coal burns as fast as it reaches the zone of air supply, *down inside the retort*. The fire usually appears hot and snappy, like a blacksmith's forge. The fuel bed is so thin that refuse (and clinkers) accumulate in the retort, and unnecessarily large quantities of heat are lost up the chimney.

It is possible to burn 45 to 55 pounds of coal per hour in the retort for each square foot of area. Many domestic stokers have a retort area of about one-half square foot, and can, therefore, burn 25 pounds of coal per hour *in the retort*. This applies particularly during the time that the fire is hot and the air supply abundant or excessive.

To prevent coal from burning in the retort it is necessary to increase the coal feed to about 50 pounds per hour per square foot or to reduce the air supply. Reducing the air supply not only will save coal but also will make a more easily controlled fire.

A study of stoker operation shows that unless the air supply is properly regulated, four undesirable conditions will result:

- (1) too thin a fuel bed;
- (2) most of the coal will be burned in the retort instead of in the firebox;
- (3) clinkers will form in the retort; and probably most important,
- (4) excess air will cause large and useless loss of heat to the chimney.

With the firebox free of clinkers and only a nominal amount of loose ash, build up a fuel bed to a height at least equal to the shortest inside distance across the top of the retort. This can be done quickest by reducing the air supply to a small part of the maximum capacity. A method for temporarily reducing air supply is to cover the fan inlet with a few sheets of wrapping paper or a cardboard. After the fuel bed has been built up, the air supply may be increased to a *minimum* that will furnish the heat required.

It is essential that coal be fed faster than it is used during "on" periods so that there will be plenty of coal in the firebox for the natural draft to work on during "off" periods. Normally the fuel bed should still be "deep" when the thermostat starts the stoker.

Seek Yellow, Lazy Flame

A yellow, almost lazy flame ordinarily indicates a sufficient air supply, especially for a stoker that is left unattended for several hours at a time. With fan operating, a flame action in the firebox similar to conditions with a brisk burning, hand-fed fire usually indicates ample air for a small stoker with fire in good condition and a fuel bed that is properly deep and wide.

The following conditions are positive signs that there is, or has been, too strong a blast of air for the thickness of the fuel bed:

- (1) Sparks flying from the fire, especially if numerous or big,
- (2) Rapid accumulation of "fly ash" in the firebox or in the gas passages,
- (3) Accumulation of fine pieces of coke at the sides and rear of the firebox or in the gas passages. This condition is an unmistakable sign, especially so if the accumulation is rapid.

An over-abundance of air can easily waste 20 to 50 per cent, or more, of the coal. Therefore, it is advantageous to have the air supply reduced until sparks flying from the fuel bed are the minimum possible for the rate at which coal must be burned in order to carry the load. It is an advantage to operate under normal conditions with substantially no sparks rising from the fire.

Each Installation Different

Experiments are the only way of finding the best adjustment of coal and air feed in any installation, because no two stokers operate under the same conditions. This applies whether the air control is "hand operated" or "automatic."

For a fan-damper some stokers have a metal disc mounted on a shaft which extends from the fan housing. The disc is moved outward (sometimes inward) to admit more air or moved opposite to reduce the supply. Often this type of damper can completely close the intake opening. In some cases there are openings in the back of the fan housing, for instance, around the fan shaft

that may admit an excessive amount of air even when the main intake is completely closed. With the single plate type of air adjustment at the fan inlet and only nominal openings in the rear part of the fan housing, it is interesting to observe how small an opening is required between the movable disc and the opening it covers. Often $\frac{1}{8}$ " opening, or less, is plenty when using small, evenly sized free burning mid-western coal in domestic size stokers.

Fig. 12 shows the shutter and air intake openings for a fan on a stoker rated at 30 pounds per hour. This stoker is in a residence using about 17 tons of coal each heating season. The two jet black areas indicate air openings, the lightest triangles are a stationary cover and the medium dark triangles are the movable disc or shutter



Figure 12. Rotating disc type of fan damper showing small openings required when using small, uniformly sized stoker coal.

which is opened or closed to regulate the air supply.

On the movable disc is a wing which acts both as a handle and as a pointer for setting the disc.

In an arc close to the wing is a series of numbers 0 to 10. With the wing at 0 the air inlet is closed, at 10 wide open. The wing is opposite No. 2. The inlet disc is therefore set at one-fifth of the maximum opening. During a week of coldest weather this stoker operated about 50 per cent of the time and used 1,800 pounds of coal. The air control was set as shown in the picture, this clearly illustrates the small amount of air required as compared with the fan capacity furnished with most stokers.

Changing the movable disc of Fig. 12 from position No. 1 to No. 2 increases the area of air inlet 100 per cent. The same length of movement, from No. 9 to No. 10 increases the inlet area one-ninth, which is 11 per cent. This illustrates an

important point stoker operators should appreciate: *when the air control device is near its "closed" position a small change of adjustment makes a large percentage change in air supply.*

When experimenting to find a good adjustment of air supply for the coal feed, start by reducing the air supply considerably. After adjustments of "hand" or "automatic" controls are close to a correct setting make only one *small* change at a time and then, if possible, allow at least a few hours, preferably a few days, to elapse before making any other change. *After the air control has been adjusted substantially correct, readjustment will be required when conditions change.*

Factors Necessitating Air Setting Change

There are several influences that cause conditions in the fire box to change and in turn make it advisable, or possibly necessary, to change the air adjustment. Some of these influences are:

- (1) Changes in mixture and size of pieces of coal entering the fire box,
- (2) Quantity and condition of refuse in the fire box,
- (3) Comparative length of time of the "on" and "off" periods of stoker operation.
- (4) Strength of natural draft and its effect on the thickness of the fuel bed,
- (5) Changing to coal with different burning characteristics,
- (6) Variable factors influence the way a given coal will cake or mat in the fire box and in turn influence the air adjustment needed,
- (7) A marked change in load that requires a decided increase or decrease in the amount of coal used per day.

It will be observed that with "hand regulation" it may be necessary to make minor changes in the adjustment of air controls fairly often. Usually it takes only a few seconds to make these adjustments at the time of regular attention to the stoker.

With "automatic" regulation, after adjustments are correctly set and if they continue to work properly, readjustments will not ordinarily be required unless there is a pronounced change in operating conditions, caused, for example, by change in the size of coal fed into the fire box, change to a coal of different burning characteristics, or a decided change in the amount of coal used per day.

With small, evenly sized free burning mid-western coal the coal feed of small stokers in most cases should be set at the maximum and the rate of burning regulated by adjustment of the air supply controls.

Regulate Burning Rate by Adjusting Air

With hand-fed domestic heating fires, coal enough for several hours, even 12 or more, is placed in the firebox at one time. The rate at which the coal is burned is controlled by manipulating the drafts (air supply). In a similar way

an ample supply of fuel should be kept in the firebox with stoker firing and the rate of burning should be regulated by controlling the supply of air.

If the demand for heat is so small the stoker is "off" for comparatively long periods, the fuel in the firebox will be consumed by the natural draft and, of course, the fire will be low, even down in the retort. To re-establish efficient conditions it is essential that the supply of air be reduced, either by "hand" or "automatic" control so that the fuel bed will be built up when the stoker again operates for a sufficient period. If this is not done, the coal will be burned practically as fast as it reaches the zone of air supply.

The top of the fire may be about level with or a very little above the top of the retort. Unless the air supply is adjusted so as to re-establish a deep fuel bed, a large part of the coal will be wasted, the heat being lost with the excess air to the chimney. Also, ash will accumulate and clinker will form in the retort. These conditions are illustrated in Fig. 12.

If the fuel bed is continuously too thin, increase the rate of feeding coal, if that is possible. If the stoker is already feeding at the maximum rate, it will be necessary to reduce the air supply to get efficient results. If the stoker is equipped with "automatic" air control, make sure the device is working properly and change adjustment to supply less air.

Methods for Reducing Air

Some machines are so built that after the air controls are shut as far as the original construction allows, the air supply may still be too great. Some machines have shutters made of two or more pieces for restricting the flow of air into the fan. Leakage past these shutters may permit too much air to be supplied to the fire. When a damper is in the discharge duct from the fan, it may be so much smaller than the duct that too much air may get past it even though it is in the closed position. In some cases the opening in the fan housing around the fan shaft is too large. Cases where air supply cannot be restricted enough, with the facilities originally provided, require ingenuity to plan methods for modifying the air control so as to reduce the air to the most efficient amount. This applies to both "hand" and "automatic" controls. In a case of this kind, one can experiment by putting some form of sheet material, such as cardboard, over part of the intake to the fan. Study the effect of various arrangements and develop a permanent device that will give the desired results, and that is easily adjusted.

One method of reducing capacity of fans with "squirrel cage" type of blade construction is to put a band of thin spring steel around the inside circumference of the fan blades and against the side opposite the intake. Two or more narrow

(Continued on page 52)

Repair, Replace, Recondition—

To Meet Defense Problems

In the December, 1941 issue Professor Konzo explained proper and improper firing methods for hand-fired coal, gravity warm air systems. But firing methods are only part of the problem of obtaining satisfactory heating. The other half of the problem is use of automatic control instruments to do what no owner ever does—constantly control the combustion rate. In this article several control methods are presented, beginning with a very simple system and ending with the system recommended by the Research Residence staff. Proper firing plus proper control is one excellent way to bring an antiquated heating plant to up-to-date efficiency.

Catechism of Proper Firing Methods [Part 2]

By S. Konzo

Special Research Associate Professor
Engineering Experiment Station, University of Illinois

Question No. 24

IS THERE any way of modernizing my hand-fired plant without going to oil or gas fired equipment?

Answer No. 24—Coal fuel has taken more abuse than it deserves. Conversely oil and gas fuels have taken more credit for automatic heating than they deserve. In fact, every manually operated hand-fired furnace can be made much more satisfactory by the addition of thermostatic controls.

Question No. 25—I suppose there are a great many ways of installing thermostatic controls, and a great variety of results can be obtained depending on what was done. But what I'm interested in now is "what is the simplest control I can put on and how good a job will it do?"

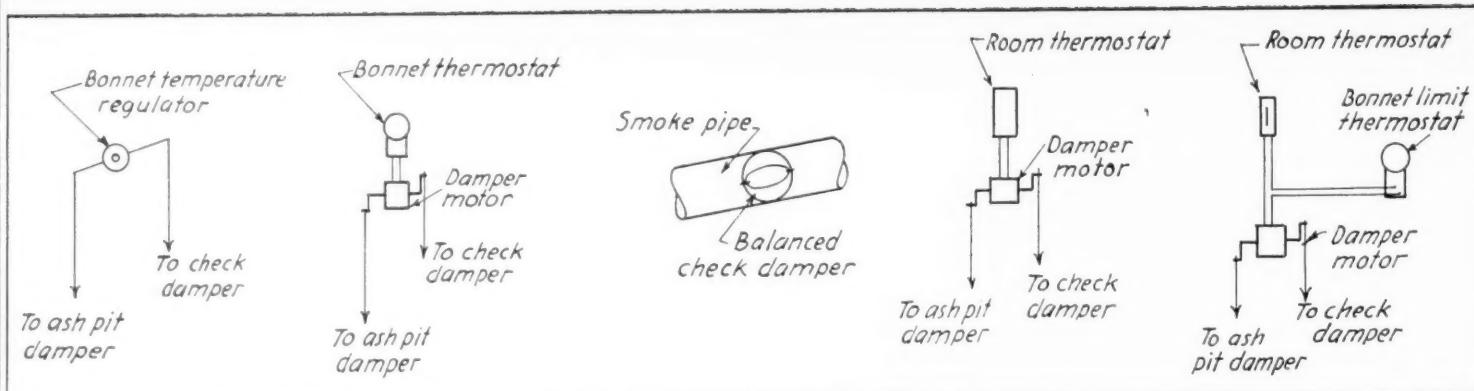
Answer No. 25—Before we discuss the question, let us consider first the sort of temperature control one ordinarily obtains by manual operation of the dampers. The wife complains about chilliness when the room temperature drops to about 68°F. The husband opens up the drafts, stirs up the fire a bit and allows the combustion to run wild for awhile. About the time the room temperature is near 78°F or 80°F the homeowner closes the draft. However, due to the intensity of the fire a considerable temperature overrun may occur with a resulting room temperature as high

as 85°F. The room temperature may vary between 68° and 85° and the average room temperature may be of the order of 78°F-80°F and definitely on the hot side. Of course, a good fireman will do better, but no human being is as sensitive to temperature variation as a mechanical thermostatic control. For our discussion we shall consider this 17° F. variation as a base value with which we can compare the effects of thermostatic regulation.

Now to get back to your question of the simplest control obtainable. I believe one of the simplest arrangements is that in which the maximum bonnet temperature is fixed. Several models are available in which a change in bonnet temperature causes a diaphragm or bellows to mechanically close and open the drafts. Usually no electrical circuit is involved, although it can be simply done by means of a bonnet thermostat operating a damper motor.

Question No. 26—Where is the room thermostat in this arrangement?

Answer No. 26—There is none. Let us consider a gravity warm air furnace with this bonnet temperature control. Suppose we set this control so that whenever the bonnet air temperature drops to about 125° F. the drafts open and when the bonnet air temperature rises to say 175° F. the



Arrangement 1

Changes in bonnet temperature operate the draft dampers (ash pit and check) by mechanical means. No electrical connection required.

Arrangement 1A

Changes in bonnet temperature operate the draft dampers (ash pit and check) by means of a damper motor requiring electrical connection.

Arrangement 2

To prevent excessive combustion rates, a ceiling can be placed on the draft by means of a draft damper located in the smoke pipe.

Arrangement 3

Changes in room temperature transmitted through a room thermostat operating the draft dampers (ash pit and check) keeps combustion in line with room heat losses.

Arrangement 4

Changes in room temperature operate the draft dampers as in Arrangement 3, but a bonnet limit thermostat protects against an overheated furnace.

drafts close. This control will maintain the bonnet temperature between these two limits. This adjustment may be about right for ordinary winter weather. (See Arrangement 1, Fig. 2.)

Question No. 27—In cold weather, then, the house may be underheated?

Answer No. 27—In cold weather the adjustments will have to be changed to maintain a higher bonnet air temperature. Conversely, in very mild weather the adjustments should be changed to maintain a lower bonnet air temperature. With a little experience the home owner may find the proper settings to maintain for various weather conditions. During the normal heating season the home owner may have to manually readjust the settings several times. The best results will be obtained if the average bonnet air temperature is maintained at a value just sufficient to take care of the heating demands.

Question No. 28—What sort of room temperature variation can one expect?

Answer No. 28—I would estimate that the room temperature variations may be between 10° to 12° F. It should be realized, however, that the home owner is relieved of a great deal of attention to the drafts. The average room temperature may average about 75° F., and hence we should expect some fuel saving over straight manual control.

Question No. 29—Suppose you use a bonnet thermostat and hook it up to a damper motor (Arrangement 1a) and then adjust the bonnet thermostat setting to open the drafts at 135° F and close the drafts at say 160° F. Wouldn't this 25° differential give better results than the 50° F differential you mentioned previously.

Answer No. 29—That would help tremendously. In a hand-fired plant, the more frequently you can make the dampers operate, the steadier will be the combustion rate.

Question No. 30—I gather then that there is a definite relation between the average bonnet air temperature and the outside weather conditions.

Answer No. 30—Every gravity plant has some definite relation between the heating load and the heat output. Unfortunately, all plants do not react in the same fashion. A well installed gravity plant, designed according to the Standard Code of the National Warm Air Heating and Air Conditioning Association, will operate with lower bonnet air temperature on a given day than a non-code job. See curves A and B in Fig. 3.

Question No. 31—What advantage is there in having a lower bonnet air temperature?

Answer No. 31—The lower bonnet air temperature is accompanied by a larger air circulation. The combination of lower register temperatures and larger air circulation results in smaller temperature differences from floor to ceiling, cooler basements, less heat waste up the chimney, and longer furnace life. In other words, the addition of thermostatic controls alone is not going to make a non-code job perform like a code installation.

Question No. 32—You indicated that there are other ways of controlling a hand-fired gravity plant besides merely controlling the bonnet temperatures. What's a second method?

Answer No. 32—Under certain conditions one of the simplest check devices to prevent excessive combustion rates, would be the use of a balanced check damper in the smokepipe (Arrangement 2 in Fig. 2). Let us suppose we have a case in which the chimney is tight and we have available a very large draft, so large in fact that combustion rates far in excess of 8-lb. per sq. ft. of grate area per hour are obtainable. Under these conditions, the flue gas temperatures can become excessively high, resulting in waste of fuel and abuse of the furnace.

In a case of this sort the balanced check damper can be used to put a ceiling to the draft and hence a ceiling to the combustion rate. The damper serves as a high limit control of the combustion rate. It can not be adapted very well to an installation having a poor chimney draft. It will

serve to retard the rate of temperature pick-up, but in doing so will protect the equipment.

If a tight chimney is available and the draft is very strong, this balanced damper, used in conjunction with any bonnet temperature regulator set, should perform quite nicely. I'll repeat again that the balanced damper is a limiting device to hold down the combustion rate to a reasonable value. It cannot be recommended for each and every installation.

Question No. 33—If you consider the balanced damper as the second method, what is a third method of control?

Answer No. 33—The third method uses only a room thermostat and a damper motor. This method is to be preferred over the first method, since the combustion process is controlled directly from the room thermostat. Tests made in the Research Residence many years ago, before anticipating type room thermostats were available, showed that the variation in the room temperatures were of the order of 6 to 8° F for a gravity plant. That is, the room temperatures varied between about 70° to 77° F. With the newer anticipating types of room thermostats, the variation should be less, probably about 5° F.

Question No. 34—Suppose you added a bonnet high limit thermostat to your third arrangement. Would there be any advantages?

Answer No. 34—The main advantage of this Arrangement No. 4 is that the equipment is protected from overheating. For example, if the

homeowner decides to raise the thermostat from a night setting of 60° F. up to a daytime setting of say 72° F., a terrific overload may be thrown on the plant. If no check is applied and the fire is responsive to drafts, extremely high bonnet temperatures may be obtained with the result that the equipment is overloaded and the combustion efficiency is greatly decreased.

This fourth arrangement consisting of:

Room thermostat

Damper motor

Bonnet limit thermostat

to my notion is the standard control arrangement for a gravity hand-fired plant.

Question No. 35—Can you adjust the setting of the bonnet thermostat so that it will tend to close the ashpit damper before the room thermostat is satisfied?

Answer No. 35—That can be done and provides a very good control. It requires resetting the bonnet thermostat to conform with the weather, but ordinarily three or four resettings during the winter season should be sufficient. With a control of this type it should be possible to obtain room temperature variations not exceeding about 3 or 4° F.

Automatic Control Saves Fuel

Question No. 36—I gather that the use of automatic control equipment is a means of saving fuel?

Answer No. 36—Fuel economy is definitely linked with control, particularly combustion control. Overheating of the rooms wastes fuel. On the average, every degree increase in room temperature over 72° F corresponds roughly to an increase in fuel consumption of about three per cent. Hence if you can maintain the average room temperature at 72° F instead of 78° F., we would expect a fuel saving of the order of 18%.

Furthermore, if extremes in combustion rates can be eliminated, the combustion efficiency will be increased. The tests in the Research Residence have shown that uniform combustion rates can be obtained in a hand-fired coal plant. Hence, by combining good room temperature control with good combustion control, one should be able to show substantial reductions in fuel consumption in the ordinary hand operated coal plant. We consider a complete thermostatic control system as an extremely good investment not only in comfort, but also in reducing the cost of fuel and upkeep of the heating plant.

Question No. 37—It seems to me that the heating contractors, and particularly the coal dealers, are missing an opportunity in this connection.

Answer No. 37—I am afraid that many a dealer has allowed a customer to swing to oil or gas without attempting to demonstrate what can be accomplished with the use of automatic controls.

Question No. 38—Don't you think that part of the trouble lies in the fact that the coal dealer may have had some sad experiences with some

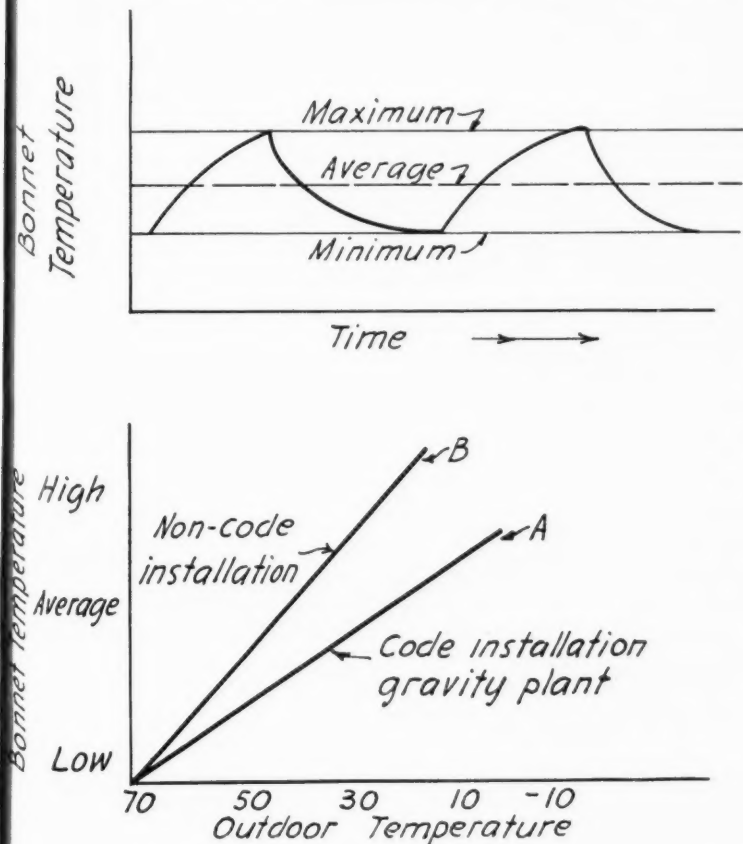


Fig. 3—A definite relation exists between the outdoor temperature and the average bonnet temperature for each gravity installation. Note that a Standard Code system operates with lower bonnet temperature than a non-Code job.

extremely cheap and flimsy control that soon was out of commission?

Answer No. 38—Undoubtedly that has been a factor. I have been in many basements where some flimsy control device has been out of commission for some time and the home-owner has gone back to hand operation of the dampers. Flimsy controls that last only a year or two have indeed soured the disposition of many a home-owner and many a heating contractor.

Question No. 39—You spoke of “demonstrating” the performance of a control unit. How can a heating contractor do that?

Answer No. 39—Suppose that I left a small recording thermometer in your home for a day with the front of the case blocked off so that you could not see the chart, and with the case locked. Suppose also that I told you to operate the plant normally. On the following day, I would have

the evidence. If you are an extremely careful fireman and managed to keep the temperature variation within 3 to 5° F., I would pat you on the back and say:

“Nice firing! I may not be able to sell you a control that will give the same results that you obtain by your constant attention, but if so I’m only out three cents for the chart.”

If, on the other hand, the temperature variations show 10, 12 or 15° F variations, I’d be willing to make you a proposition involving the trial of the control. If you find it satisfactory, as I am sure the records would indicate it to be, I would have a sale. If you still don’t want it, out it comes. That to my notion is a real demonstration, based not on models, but on your own plant. The evidence is in the printed charts. This demonstration could be made during the winter when business is slowest. Isn’t that a convincing demonstration?

Rudiments of Small Stoker Operation

(Continued from page 48)

bands set close together can be used to obtain the width desired. The bands should be cut such length that the ends just meet. If properly installed, they will not unbalance the fan.

With a stoker, if the rate of feeding coal exceeds the rate of air supply, fuel will accumulate in the firebox. Some of the accumulated fuel will be burned by the natural draft during the time the stoker is “off.” If the effect over a period of several hours or a few days is to maintain a deep bed of substantially constant volume of fuel (not fuel and refuse), the air supply and coal feed are well adjusted for the rate of burning and for the size and character of the coal.

When to Increase Air

If the bed of fuel continually increases in size until the depth becomes two or more times the shortest inside distance across the top of the retort, the rate of air supply should be increased. If the air supply appears to be near its maximum, it may be advisable to reduce the rate of coal feed, but it is quite possible that something between the fan and the firebox may be interfering with the flow of air. Such interference could be caused by excessive ash in the firebox, clinker in the retort or tuyere openings, droppage into the air supply chamber, or a cake-like deposit on the inside of the retort castings obstructing some of the tuyere openings. If the fuel bed becomes smaller as the hours or days go by, decrease the air supply or increase the rate of coal feed.

Experimenting to find the most efficient adjustment of controls will take a little time, but the resulting economy and comfort will more than compensate for the effort taken. Changing heat demands that accompany wide changes in outside temperature will call for new adjustments, but

once the stoker operator has mastered the fundamentals, only a few seconds will be needed to set the stoker for the changed weather.

Tri-Level Houses

(Continued from page 39)

used in about 80 per cent of the houses and oil or gas, forced air systems, in approximately 20 per cent of the houses. Because of the compact, practically straight up supply systems, gravity flow works very well, but where a little better air distribution and forced circulation plus automatic firing are wanted by the buyers, the oil or gas, forced warm air systems, meet every requirement.

In these Madison houses Reinicke and Krueger installed oil-fired, forced air Airtemp model O-70 furnaces having a 63,000 Btu output at the register with approximately 900 cfm delivery from the blower. The heat loss of the houses is approximately 55,000 Btu. This furnace lends itself particularly well to its utility room placement since the blower is below the furnace and all motors, burners, etc., are outside the front (see photograph), where service and inspection are easy.

A typical system as shown in the photographs required approximately 450 pounds of duct work including casing and plenum—indeed frugal of material for such a spacious house.

Indicative of costs is the sales price of \$3,500 (exclusive of lot) for the living room-library house plus \$50 more for the house with three third level bedrooms. This house will be heated with a steel, coal burning, gravity furnace. An oil fired furnace with blower costs about \$150 higher—as does the gas-fired forced air unit. Cooke Construction Co. reports that the house with three bedrooms on the third level has become so popular that other layouts are practically discontinued. The prices prevailed last fall. Today, probably an additional \$200 must be added due to higher costs.

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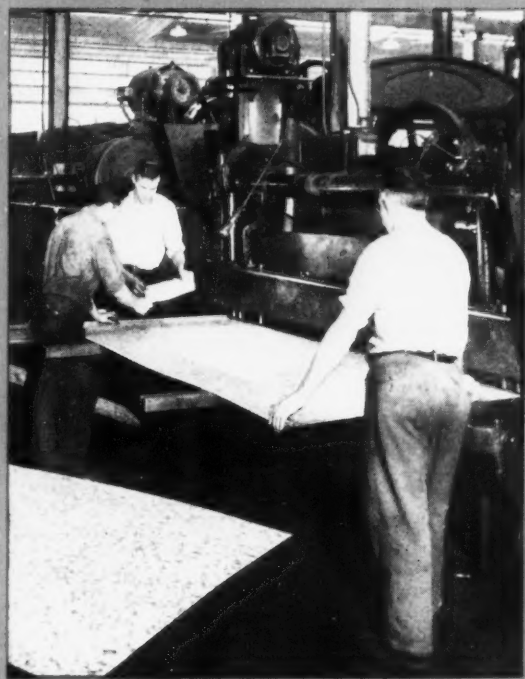
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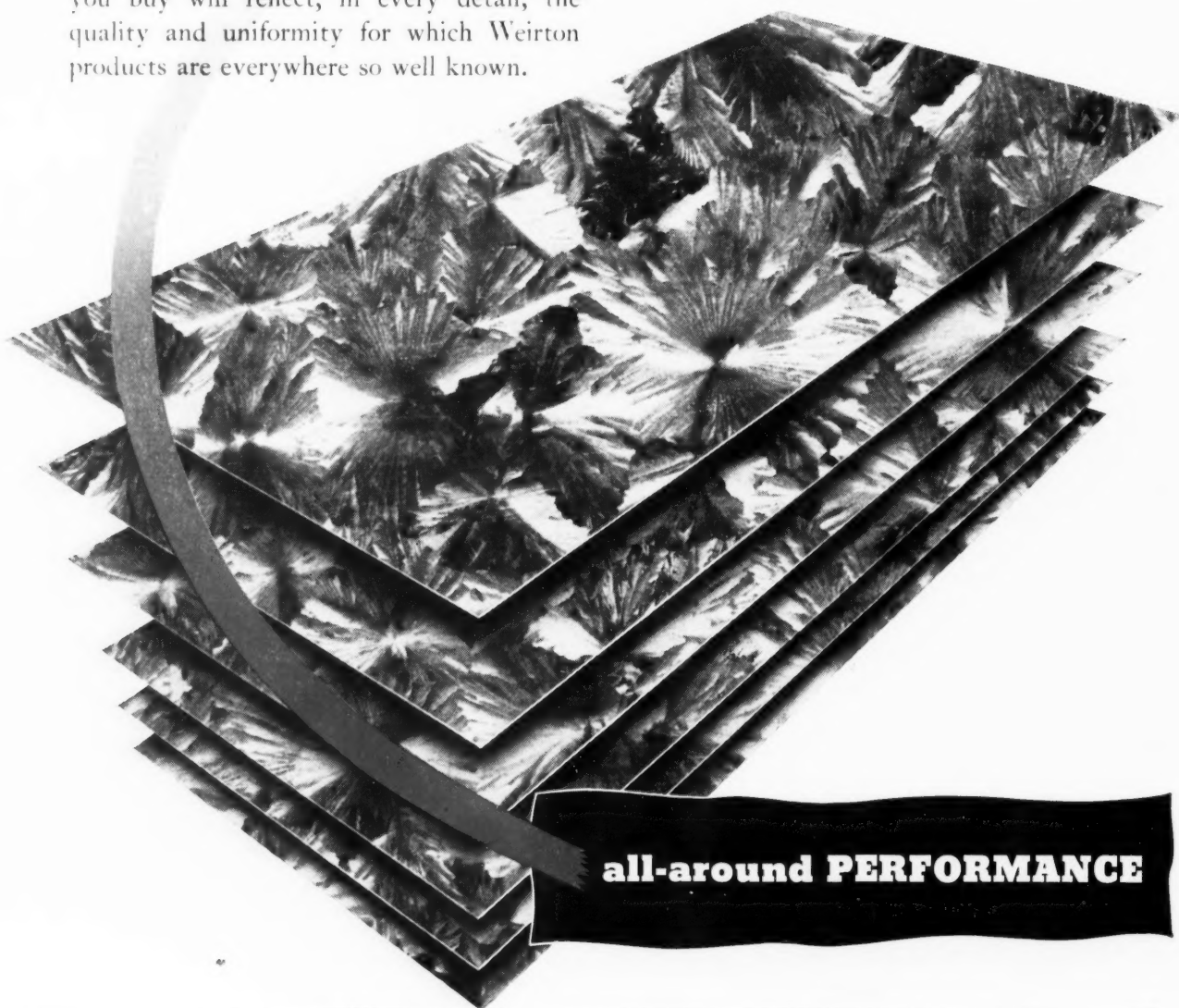


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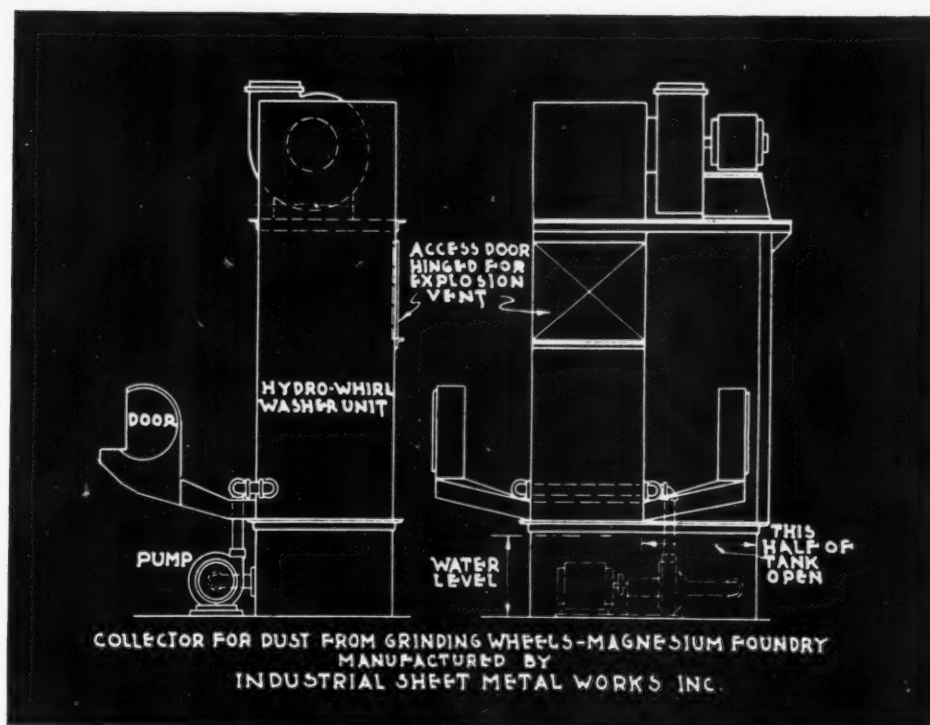
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Wet Collector For Magnesium Dusts

RECENT and increasing numbers of explosions and resulting fires in plants where magnesium and its alloys are being worked, whether in foundries or in machine shops, have brought to light the extremely important problem of adequate, economical and safe dust control in magnesium materials.

It is evident from the number of these plant disasters that the ordinary methods of collecting magnesium dust are anything but satisfactory. The hazards indicate that an entirely new angle of approach to this problem is necessary before safety may be assured. Chemical engineers who have made a thorough study of magnesium dusts, state that the usual type of dry collectors cannot and must not be used.

The recommendation suggests a wet type of collector, of relatively small size, each collector serving a few wheels in preference to a large collector which has a capacity adequate for the entire shop.

Considerable research in wet type collectors suitable for magnesium dusts has been carried on and collectors are now available which eliminate this dust hazard. For example, the Industrial Sheet Metal Works, Detroit, faced this problem some time ago and spent many months in developing an efficient collector called the "Hydro-Whirl" which uses water to wash the dust out of the air. Following development and observation under actual shop conditions, chemical engineers from the laboratories of the Associated Mutual Fire Insurance Companies observed the results and published a report in the "Quarterly,"

April, 1941, publication of the National Fire Protection Association.

The illustration shows a standard unit designed for a two-wheel polishing, buffing or grinding jack. It is ruggedly constructed of plate and angles and does not occupy a great deal of floor space.

The size of the unit is governed entirely by the diameter of the grinding wheel and the consequent volume of air exhausted through the grinding wheel hoods.

A definite standard of five inches of suction pressure at the hood throat was established to be sure that no magnesium dust would settle in the hood itself or the pipe connection to the collector.

After the dust laden air enters the collector it passes through an extremely heavy rain of water which is actuated by a recirculating pump and the high velocity of the air itself. The dust is literally whirled out of the air stream and settles into the water storage tank of the collector in the form of a sludge. The cleaned air then passes up through a series of baffles which remove the water and from there through an exhaust fan into the building itself.

The tests have proved that since all of the dust and the moisture have been removed from the air it may be returned to the building. Where many units are installed in one building this provides for a considerable saving in winter heating losses.

The Industrial Sheet Metal Works "Hydro-Whirl" is a Patented Unit.

By R. C. Nason



Exterior of Ever Ready Roofing Co. shop and typical street of houses in Strathmore where the firm has installed more than two car loads of 2-pound lead sheets as flashing, valleys, stops, etc. Earlier houses in this project (1,200 homes to date) used copper by Ever Ready.

Light Lead Sheeting On a Housing Project

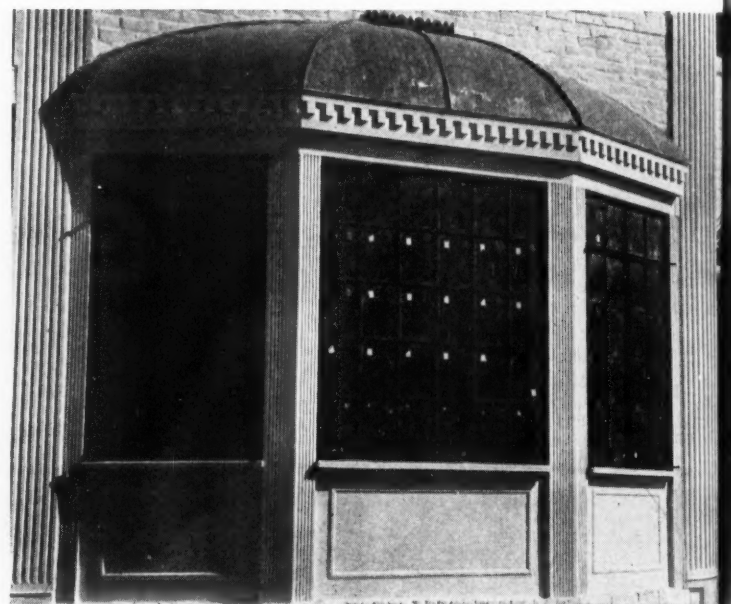
SATISFACTORY results in architectural usage can be obtained through the substitution of 2-lb. roofing lead for more common sheet metals which are hard to get finds the Ever Ready Roofing Co., Inc., Valley Stream, N. Y. Proof was adequately furnished in a housing project the firm is now finishing involving sheet metal and roofing work on 175 homes ranging in price from \$8,500 to \$20,000 and known as Strathmore-in-Manhasset, L. I. Metal requirement for flashing, drainage, roofing and waterproofing on this development required two carloads of Roofloy, a new lightweight lead sheeting.

Some of the shortcomings of sheet lead in the past for ordinary application in such housing developments are well known to sheet metal contractors, meaning ultra softness, difficulty in working, too much weight and too high a cost for bulk projects. But with the introduction lately of new, light-weight sheeting, 2 pounds to the foot, the foregoing difficulties have been overcome, believes the Ever Ready organization.

This residential project includes a rough total of 1,200 homes, erected during the past seven years and creating employment at times for 1,500 craftsmen. All these dwellings have been sold except the current group and practically all now are occupied.

Formerly, sheet copper was used by Ever Ready

on architectural applications of this type, but the light lead sheeting now is the preferred metal employed except in air conditioning work. It might be added that more than one-half of the



Bay windows of many types and sizes are popular with the builders of Strathmore. Standing seam light lead is now used applied as shown here.



Above—Light lead base flashing around base of a deck.
Right—Nailing a gravel stop of light lead on a garage.
Below—Application of a valley strip (12 inches by 8 feet) using light blows on a 3-foot length of 2 by 4. Ever Ready finds this material easy to cut and form and easy to apply.



total number of dwellings in this development are equipped with warm-air heating, installed by Jowein, Inc., Jamaica, L. I.

Asked to comment on the characteristics of the light sheet lead versus other materials, a representative of the Ever Ready company offered some suggestions that should prove helpful. For example, brick flashing calls for two-coat painting with asphalt-base paint of both surfaces of the metal. This prevents deterioration due to mortar contact, finds the contractor.

Another hint has to do with soldering. Avoid use of too hot an iron; it's better to use a medium or cool iron, he emphasized, because lead, being softer and of lower melting point than materials such as copper is more easily injured by hot iron and heavy hammering. Perhaps the best procedure, the firm believes, is to start experience with this sheeting with a medium iron then work up to a hotter iron as expertness permits. This sheet metal contractor further advises that after the mechanic has gained the correct touch he can solder the lead as rapidly as copper and other metals.

One of the favorable features of light lead is said to be the ease with which the mechanic can lay an open valley. The Ever Ready mechanics cut valley strips 12 in. wide and full 8-ft. length in the shop, then re-roll for trucking to location. Mechanics lay the flat strips over the valley and form the V by lightly hammering with 3-ft. pieces of 2 by 4 inch lumber laid lengthwise at the proper point. Side edges of valleys usually are attached to roof sheathing by 1½-in. wide copper cleats on 2-foot centers or nailed without cleats.

In accompanying illustrations there are shown a standing seam roof on a bay window. This is a

common usage in this development. The stands usually are made ¾ in. deep and are formed the same as with 16-oz. copper, points out the contractor's representative. Bay roofing in the Strathmore development is painted in some cases, allowed to weather naturally in others.

Another suggestion offered has to do with expansion joints, which are recommended in working this sheeting, particularly in long continuous applications such as flashing, gutters and capping. Provide expansion joints from 10 to 14 ft. apart, advises the contractor, who adds the recommendation that loose joints always are better in service than tight nailing.

(Continued on page 100)



Right Angular Elliptical T-Joint Oval Pipe and Semi-Circular Ends*

By William Neubecker

Head Instructor

Sheet Metal Department, New York Trade School

A CORRESPONDENT from Dayton, Ohio, makes the following request: "Please send me a layout of the elliptical tee joint as shown in the diagram herewith enclosed." The diagram shows an "oval" pipe with semi-circular ends whose major diameter is 22 inches and whose minor diameter is 14 inches. The height of the vertical arm of the tee is given as 5 inches.

In this connection it is proper to say that regardless what the dimensions may be, the principles explained in connection with the drawings shown herewith are applicable to any shape or dimension.

To save space in the end and side elevations, only semi-sections of the "oval" are shown. In the end elevation $T-A-T^v$ represents the semi-section on the line $S-T$ in side elevation. Through A in the end elevation draw the perpendicular line $A-B$, on either side of which draw semi-sections of the "oval" similar to $T-A-T^v$ in the end elevation as shown by $B-F-1$ and 1^v . Establish the height of the vertical arm of the tee as shown by $A-E$ and through E draw the horizontal line $1-1^v$ equal in length to $1-1^v$ in the "oval" section above.

Through D in the semi-section draw the horizontal line $X^v-X^{\circ\circ}$ and draw lines from X to 1 and X^v to 1^v to complete the end view of the vertical arm of the tee.

Now complete the side elevation of the vertical arm of the tee as shown by $4-X^{\circ}-X^{\circ\circ}-4^v$ and above this view in its relative position draw the semi-section of the "oval" representing a section on the line $4-4^v$ all as shown.

Pattern for Vertical Arm

The pattern for the vertical arm is now in order, and will be developed by triangulation as follows: Space both quarter circles in the sections in both elevations in equal divisions as shown by the numbers 1 to 4 and from these points draw perpendicular lines to intersect both upper lines in the end and side elevations as shown respectively by similar numbers 1 to 4 in both elevations. From points 1 to 4 in end eleva-

tion draw lines to the apex X and from similar numbered points in side elevation draw lines to the apex X° . The lines shown in the triangle $1-4-X^{\circ}$ in side elevation will represent the bases of triangles to be constructed whose altitudes will be equal to the projections between similar numbers in the end elevation. Therefore from points 1 , 2 and 3 in the end elevation drop perpendicular lines indefinitely as shown.

Now take the lengths of the lines $X^{\circ}-1-2$ and 3 also the line $1-Y$ in side elevation and set them off in end elevation on perpendicular lines previously drawn from similar numbers, always measuring in each instance from the line $X-X^{\circ}$ and in this manner obtain points marked $1^{\circ}-2^{\circ}-3^{\circ}$ and Y° from which points draw lines to the apex X , which will be the desired true lengths.

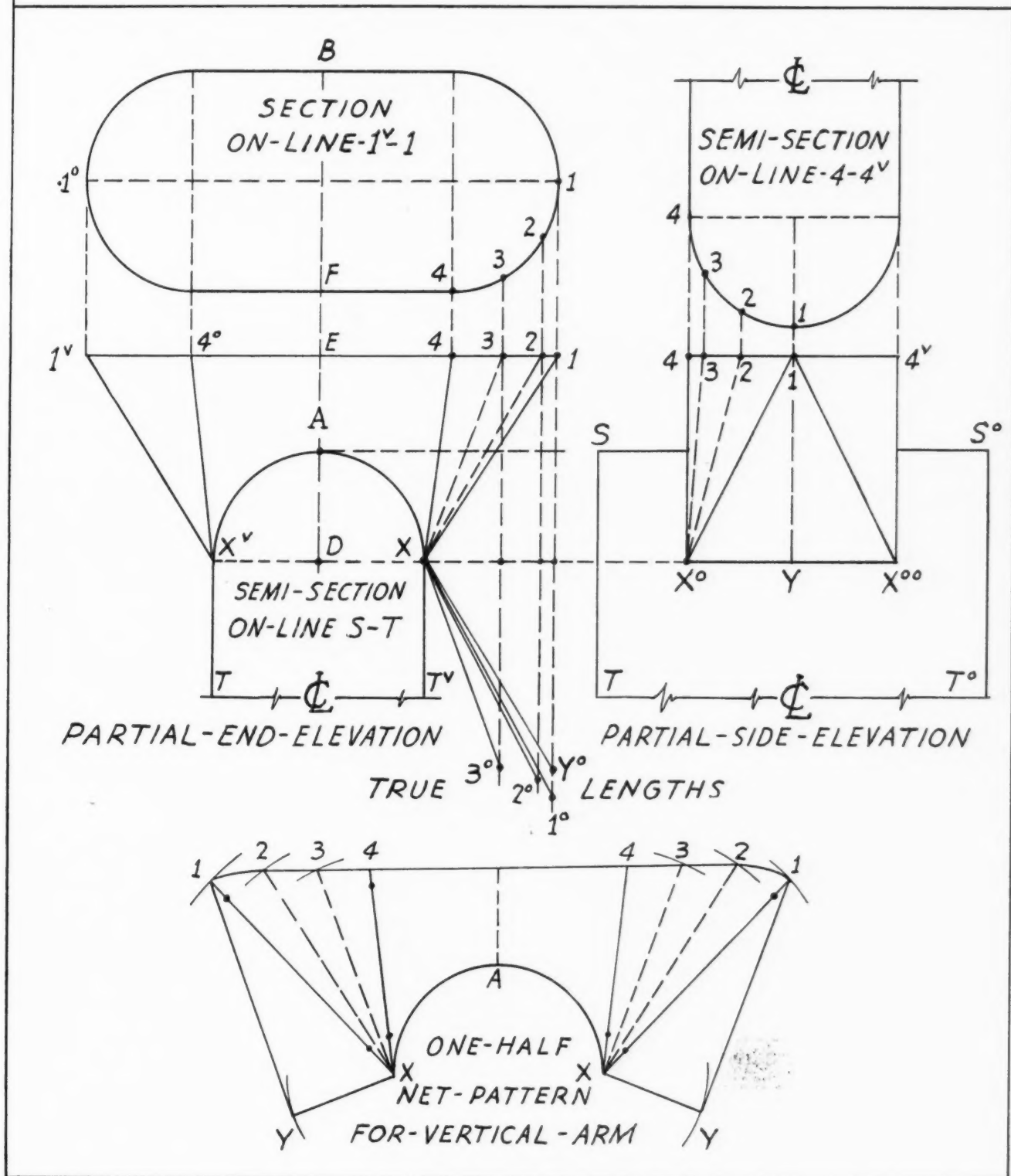
One Half Net Pattern

The pattern can now be laid out as shown in the lower part of the illustration. Take a tracing of $4^{\circ}-4-X-X^v$ in the end elevation and place it in the pattern as shown by $4-X-X-4$. Now with radii equal to $X-3^{\circ}-2^{\circ}$ and 1° in the true length and with X in the pattern as center describe short arcs near $3-2$ and 1 on both sides. Now set the dividers equal to the divisions 4 to 3 to 2 to 1 in either one of the quarter circles of the "oval" and starting from 4 in the pattern shape step to arcs 3 , 2 and 1 and draw a line from 1 to X . With a radius equal to $X-Y^{\circ}$ in the true lengths and with 1 in the pattern as center draw short arcs near Y and intersect them by arcs struck from X as center, with $X^{\circ}-Y$ in side elevation as radius. Draw lines from X to Y to 1 in the pattern shape and trace a curved outline from 4 to 1 on both sides to complete the one-half net pattern shape.

When forming the pattern slight bends are made on the lines shown dotted. The opening to be cut in the horizontal "oval" pipe is simply a rectangular shape, whose width is equal to $X^{\circ}-X^{\circ\circ}$ in side elevation and whose length is equal to the girth of either one of the semi-circles in either sections. Laps and flanges must be allowed as required.

*All rights reserved.

*PATTERNS - FOR - RIGHT-ANGULAR-ELLIPTICAL
- TEE - JOINT- OF - SIMILAR - AREA -*





Left to right—H. L. Consley, assistant works manager; Hal Shive, superintendent; a sheet metal worker; Clair Koons, Junior foreman; sheet metal worker. Clair Koons, former skilled workman, has assumed the duties of foreman, is explaining a shop drawing to the new workers.

Do More With What You Have*

By H. L. Consley

Assistant Works Manager, York Ice Machinery Corp.

THE very extravagant theme of this Conference ("How to step up production without the purchase of major equipment or large-scale hiring of skilled men") seems, at first thought, to be asking for a recital of miracles and yet after giving the subject serious thought, I realize that we have been doing just the thing that the theme indicates, but our outstanding measure of achievement has been cost rather than volume of production.

Today we are thinking more about *doing the best with what we have*, which is the basis upon which the now famous "York Plan" was developed. It is impossible to secure equipment, it takes time to train men; therefore, we as managers, engineers, manufacturers, must find ways to *do more with what we have* if we are to be successful in the National Defense Program.

The experience story that I am going to relate is one which has to do with a job we have actually

done and proven in our Sheet Metal Shop. This shop is not what would be termed a big production shop, nor is it entirely a jobbing shop. It is some place between these two, with some fairly good production jobs, some slightly repetitive jobs, and some individual jobs that never repeat. This shop now employs 150 to 200 men. The production consists of sheet metal work used in the construction of air conditioners, air washers, coolers, condensers, etc. A large percentage of these products are used directly by the Army and Navy and a greater part by other industries in the processing of material used directly in the National Defense Program.

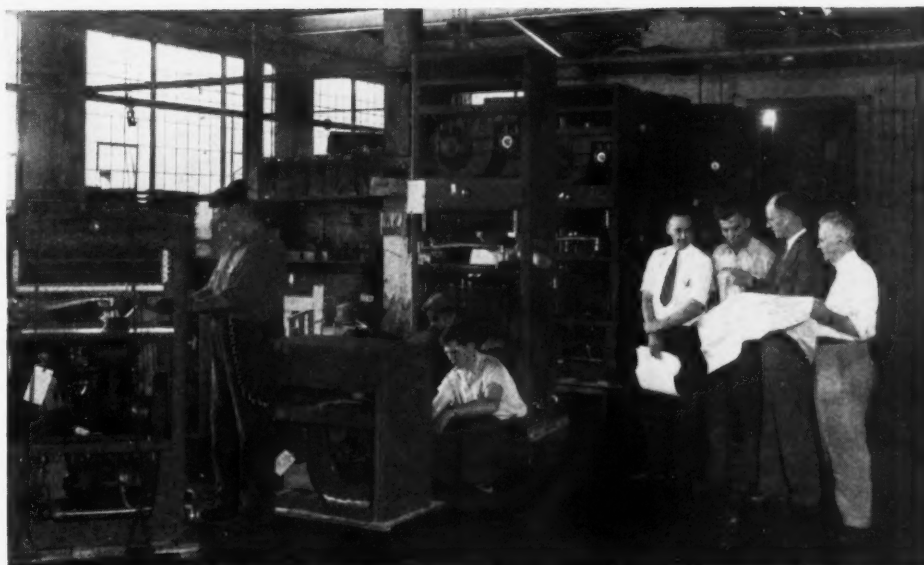
Our accepted procedure at one time was to furnish engineering drawings to sheet metal workers who used the usual run of equipment found in sheet metal shops, such as shears, brakes, presses, spot welders, etc. Thus, at the start of our analysis, there were three production factors that stood out for consideration for improvement or speed-up.

*Paper delivered at a special production conference of the American Management Association.

Right—Sheet metal shop with Yorkaire conditioners leaving assembly line for testing chamber. Shop planning released skilled men to act as foremen, set-up men, methods men, etc.

Group, left to right—Martin Clair, head of testing and inspection department; Sam Williams, assembly foreman; H. L. Consley; Hal Shive, shop supervisor.

Below—C. E. Noel, chief draftsman and draftsman J. H. Wisenall, formerly a skilled workman, now transferring his skill by means of drawings.



1. Drawings.
2. Sheet Metal Workers.
3. Manufacturing Equipment.

At once item No. 3, manufacturing equipment, was eliminated due to three things—

1. It costs money and increases overhead.
2. To house it, buildings are needed which in turn cost money and take time to build.
3. It is impossible to secure equipment in a reasonable length of time, if at all.

What the Sheet Metal Mechanic Does

We then focused our attention on the sheet metal worker himself. Bearing in mind that we were working from engineering drawings, we attempted to set down in black and white, the things that the sheet metal worker actually did and we were surprised at the number and the importance of his jobs. The record of his activities divided itself into eight jobs as follows:

1. LAYOUT.
 - a. Visualization of a solid shape as a plane surface.
 - b. Practical application of plane and solid geometry.

- c. Application of allowance in measuring—
Stretch and crawl of metal.
General metal performance.
- d. Determination of the economical use of material—
Location of seams.
Number of seams vs. size of sheet.
Cost extras on size of sheet.

2. DESIGN OF JOINT AND CONSTRUCTION.

- a. Size rivets.
- b. Spacing of rivets.
- c. Number of spot welds per foot of seam.
- d. Seam welding.
- e. Caulking.
- f. Soldering.
- g. Brazings, etc.

3. SELECTIONS OF OPERATIONS.

Determination of the sequence of operations so that they do not interfere with each other.

4. SELECTION OF EQUIPMENT.

- a. Size and capacity of shear, brakes, etc.
- b. Tools, Dies.
- c. Multiple or single punch, etc.

5. PLANNING OF THE JOB.

- a. Writing of bill of material in form of material requisition.
- b. Securing of material.
- c. Collecting of tools.
- d. Fixing of shipping date, then scheduling of operations.

6. SET UP.

Equipping of the brakes, presses, etc., with dies, punches, bars, stops, templates, etc., for the specific job.

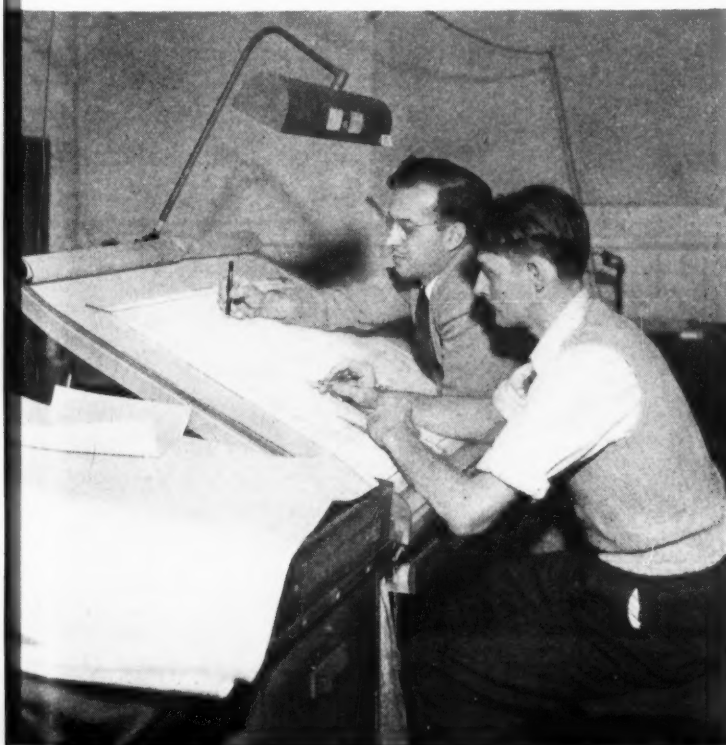
7. MACHINE OPERATION.

Operating of any or all of the tools in the shop.

8. ASSEMBLY.

- Riveting.
- Spot Welding.
- Bolting.
- Soldering.
- Caulking.
- Testing.

Tagging and forwarding to Shipping Department or to other stop departments.



Unskilled Men Become Machine Operators

This brought us face to face with the realization of the fact that our problem was one of transferring skill and specialization of jobs. It became evident at once that to do this we must record the skill in some way so that less skilled men could do the job. This meant that we must furnish the shop with:

1. Complete drawings of single pieces in full detail with definite tolerances on each measurement and specification.
2. Shear chart showing how to cut the pieces out of the sheets specified.
3. Bill of material covering all items required—this to be used as a material requisition.
4. List of the operations and their sequence.
5. Name of the department in which the job will be done.
6. List of equipment or work stations to be used.
7. Incentive allowance for the setup and for each operation.
8. Scheduled date for each operation.

This would be the guarantee that all vital information and all work done on each job was recorded, thus eliminating the preparatory work each time the job was repeated in the shop.

Blueprinting Machine Operations

This was an enormous undertaking. Trained people were not available to record the information, or at least we thought they were not. This was solved, however, by using the most flexible sheet metal workers in cooperation with the most flexible draftsmen—and shortly shop drawings, with everything on, were coming through into the shop.

This at once eliminated five of the eight skilled

jobs of the sheet metal worker. He did not have to—

1. Layout.
2. Design joints and determine construction
3. Select operations and their sequence.
4. Select equipment.
5. Plan the job.

This left then, only these three of the eight operations to be done by workmen in the shop:

6. Setting up of tools, presses, brakes, shears, etc., which in reality did not require a sheet metal worker, but rather a specialist who was familiar with the dies, tools, and machinery. These men, in most cases, were trained from helpers and handymen in the shop.

7. Machine Operating, which again did not have to be done by sheet metal workers. They were trained within a short time to operate specific tools and not sheet metal working tools in general.

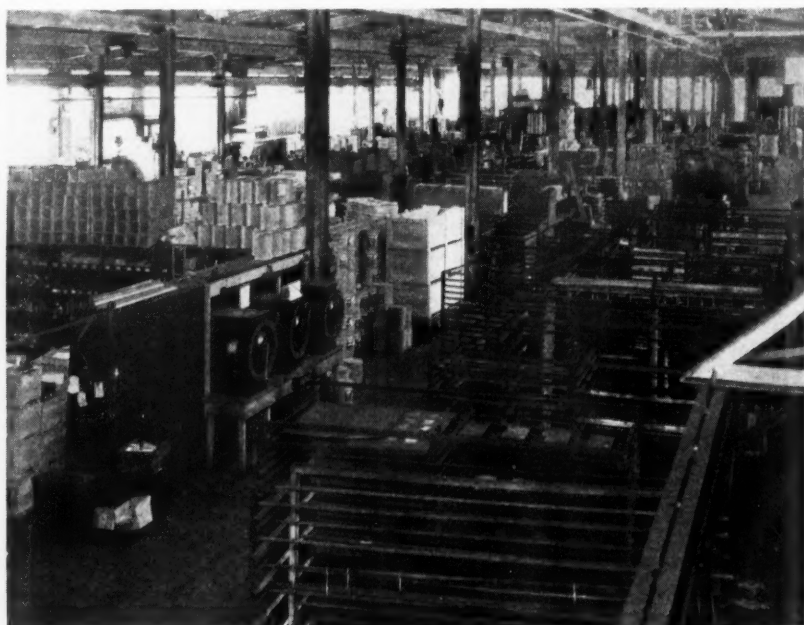
8. The Assembly work which was largely a matter of putting parts together in accordance with a pre-determined plan and as a result, these men could be trained from new employees of average intelligence in a very short time.

We Do More With What We Have

Thus, we were in position to use our trained, highly skilled, and much valued sheet metal workers as foremen, gang leaders, set-up men, instructors, layout men and as methods men. In this way we accomplished the following things:

1. We increased greatly the ratio between non-skilled and skilled employees.
2. We increased the productive capacity of the equipment.
3. We increased the productive capacity of the shop as a whole.

(Continued on page 65)



South and north halves of York's sheet metal shop showing—left—shears, presses, brakes and—right—assembly and testing lines.



McCarthy's 1874-1942

ONE of the smartest shop and office buildings in all of Indiana is McCarthy's in Vincennes. The spotless white metal brick exterior and the distinctive name sign shown in the photograph make the building stand out in high relief to the shaded public square across the street.

There's a story behind the sign. The firm had the idea of refacing the building and knew what it wanted in the way of a white front, but the problem of a suitable and distinctive sign didn't get very far until a story appeared in the January, 1941, *ARTISAN* showing and describing the distinctive sheet metal signs California contractors make for business establishments.

These signs, using blocked letters held off the wall and flood lighted from behind, were just what McCarthy's had in mind. So several ideas were sketched with the final result shown.

The name—McCarthy's—has individual block letters, quite modernistic and stands on a winged base which also conceals the lights which illuminate the white front and thereby put the letters in bold relief. Sheet Metal Works and Furnaces, Stokers are lettered in relief on the black base.

Firm Founded in 1835

There's an even more interesting story behind the McCarthy firm. In 1835 one, Dubois, grandfather of the first McCarthy on the mother's side, opened a tin shop in Vincennes. Then, in 1874, Peter R. McCarthy opened a sheet metal, tin-

smith, hardware and stove store.

John H. McCarthy, son of Peter, took over around the turn of the century. At present John H. is still active in the affairs of the firm, but management is in the hands of L. D. O'Donnell and Mrs. O'Donnell who is the daughter of John H. Mrs. O'Donnell does an excellent job of running the office. Last year, 14 year old Larry O'Donnell was started out as a solicitor for furnace cleaning; so there are now three generations of the four generation McCarthy family active in the business.

Diversification Is Key Sales Policy

As might be expected, McCarthy's, during its long life, has witnessed many changes. Starting with tinware and stoves with the founder and becoming one of the best known sheet metal shops in Indiana under John H., today furnace heating, insulation, ventilation, stokers, carry the bulk of the income. Under Mr. O'Donnell, diversification of activity has been rapid, on the theory that all eggs in one basket makes for peaks and depressions, whereas several services to offer levels out business income and places the firm in a position to take advantage of all possible trends in sales.

Two lines of furnaces are sold; soft coal stokers are carried; window fans and attic fans are being introduced; and rockwool insulation blown

(Continued on page 68)

Fume Removal Hoods For Electrotypes Pots

By Paul R. Jordan

Paul R. Jordan Co., Indianapolis

THE fume exhaust installation shown in the sketches is located in the plant of an electro-type company. Fumes thrown off by the pots in which the white metal is melted, had previously been taken care of reasonably well by the general room ventilation; but the new laws bearing on occupational diseases have caused the insurance companies to be more rigid in their inspection. They asked that hoods be put over these pots.

One of these pots, 25 in. by 40 in., is backed up against the brick flue which carries off smoke from the fire underneath the pot. Two of these pots 29 in. by 48 in. are backed up against the masonry flue which carries away the smoke from the fires under both pots. Another round pot stands in the open.

The 25 in. by 40 in. pot has 1,000 sq. in. of area. Due to certain equipment, it is not possible to use hoods over the rectangular pots. It is, therefore, necessary to design the system with slotted hoods placed at the end of the pot.

Basic Data for Problem

It should be borne in mind that the basis for figuring any ventilation problem is volume and not velocity. For an ordinary tank containing liquids, 200 cu. ft. per minute for each sq. ft. of area will suffice. Molten metal, however, with much higher temperature, gives off much hotter fumes and it is necessary, therefore, to figure 250 cu. ft. per minute for each sq. ft. of surface area. On account of the more rapid rise of the fumes, they tend to get away before the exhaust can pick them up.

The single pot 25 in. by 40 in., figuring 1,000 sq. in. of surface area has about 7 sq. ft. of area, calling for (7×250) 1,750 cu. ft. per minute. The two other rectangular pots 29 in. by 48 in. each having 1,392 square inches or $9\frac{2}{3}$ square feet, calling for 2,417 cu. ft. per minute each, or 4,834 cu. ft. per minute for the two.

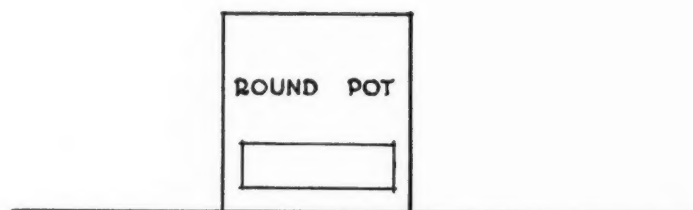
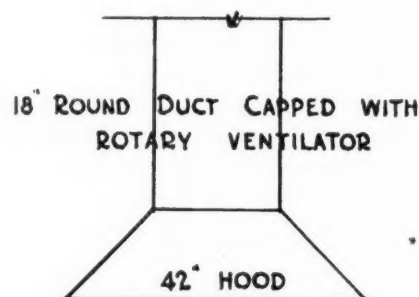
It so happens that the single rectangular pot is close to an outside window, and the owner requested an exhaust going out this window rather than up through the roof. The horizontal discharge through the window naturally calls for weather louvres, which are a nuisance, and which frequently are neither durable nor air tight. Furthermore, the fumes may blow back through an adjoining window and wind action is bound

to fight the discharge. Notwithstanding all of these objections, the horizontal discharge will give reasonably good results most of the time, and the owner preferred it to going through the roof, which is of concrete slab.

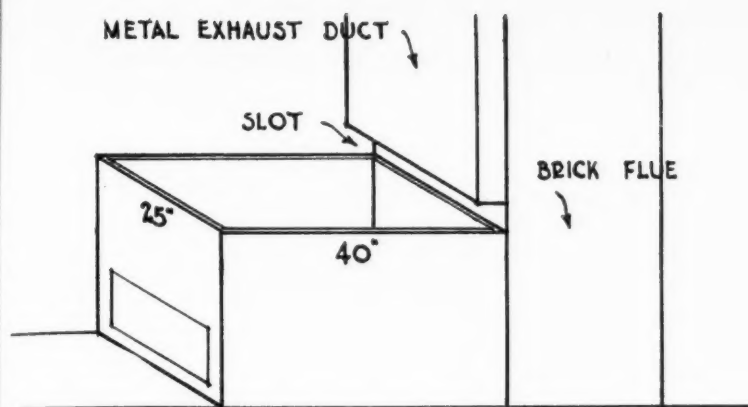
The two pots 29 in. by 48 in. are located toward the center of the room, and the owner consented to allowing the installer to go through the roof with the joint flue, capping it with a 24 in., high speed, fan ventilator. Both motors have to be of the totally enclosed type, and must also be enclosed in protective housings, ventilated from the outside. The fumes are so hot that they will burn out the motors if they are not cooled with outside air. Room air is suitable for cooling the horizontal fan. The fan ventilator is, of course, cooled with air from above the roof.

Limitations of Slot Head

Under average conditions, a slotted hood is not effective more than 2 ft. out from the slot. This experience is borne out in this case. This was explained



ROUND POT WITH OVERHEAD
HOOD AND GRAVITY EXHAUST



RECTANGULAR POT WITH SLOTTED HOOD AND FAN EXHAUST

to the owner before the job was sold. In cases where it is necessary to take care of a pot (or tank) surface farther than 2 feet from the slot, it can be accomplished by running a pipe along the edge of the tank opposite the slot on the inside of the tank and just above the surface of the metal or liquid. Small holes are put in the pipe in such a way that air under high pressure from the pipe will shoot across the surface toward the slot. This will drive the rising vapors toward the slot, and give the exhaust a chance to pick up the vapors. The objection to such an arrangement is that the pipe interferes with the handling of materials in and out of the pot. Furthermore, the high pressure air currents have a tendency to cool the metal. This owner, therefore, said, "Just go ahead and do the best you can without it."

Results from System Described

Now as to the results obtained, while the molten metal is undisturbed, the slotted hoods catch about 75 per cent of the rising fumes. Cross currents within the room get at the fumes farthest away from the slot before the exhaust can grab them. The saving factor in this particular case is the fact that the production of fumes is slight while the molten metal is quiet. The

greatest fume production takes place when the operator, using a wooden pusher, pushes the impurities and oxides off the surface. This pushing is done from the near edge of the pot, toward the far edge where the slot is located; therefore, the pushing action in itself carries the smoking metal within range of the exhaust.

The owner is very well satisfied with the operation of this system, as is also the insurance company. It is wise, however, to explain the limitation of such a system in quoting. The owner should understand just what he is buying before the sale is made.

The Over Pot System

Now coming to the round pot. This pot itself is round, and is taken care of by a 42 in. round, open type hood. The pot has to be accessible from all sides. The owner suggested a gravity installation. On a gravity installation experience shows that a ratio of ventilator diameter to hood diameter of 1 to 5 is usually satisfactory. This 42 in. round hood has an area of 1,385 sq. in. Thus a 1 to 5 ratio calls for an 18 in. ventilator (254 sq. in.) Due to the absence of any interfering overhead equipment, this round duct could be run straight through the roof overhead and was capped with a rotary ventilator. This ventilator must be swung on a bearing which will not be effected by the fumes, or by the deposits which these fumes lay down on every surface.

On the basis of accepted practices this gravity hood should be 100 per cent efficient, excepting in the presence of extreme cross currents, and excepting when there is insufficient intake into the room to take care of both of the fans and the ventilator. In this case there is plenty of intake through loose and broken windows and this gravity installation is reported by the plant superintendent as being 100 per cent efficient under all conditions. This merely demonstrates the fact that an overhead hood is markedly superior to a slotted hood, for the handling of hot fumes. A slotted hood should be used only when cold fumes are to be handled, or when an overhead hood can not be installed on account of the equipment or of something else beyond the installer's control. It goes without saying that any hood must carry a proper hood ratio.

Doing More With What You Have

(Continued from page 62)

4. We decreased by 20 per cent the amount of supervision required in instructing the men how to do the job, because the drawings were simple, plain, and complete.

5. We simplified materially the job of making time studies.

6. We decreased the time required for setting rates by 28 per cent. This increased incentive coverage from 30 to 97 per cent which in turn increased production through improved worker effort.

7. We found and located interchangeable parts on various units that could be built in stock lots. On some pieces the setup time was 10 to 20 times greater than the operation time due to the small

quantities. This was materially improved by bringing through stock lots of interchangeable parts.

8. We reduced the inspection time by approximately 25 per cent.

9. We simplified the planning and scheduling activity to a point that permitted it to really work.

Through this procedure we materially increased the productive capacity of the shop without increasing skilled labor or equipment, and proved definitely that through shop drawings, transfer of skill, specialization of work, and better planning and control, we could "DO MORE WITH WHAT WE HAVE".

Abrasive and other finishing in

"Streamlined" Sheet Metal Training

This concludes the series of articles by Mr. Zideck. The first article appeared in the September, 1940 issue—there has been an article in most every issue since. Reprints have not been printed, but a few single article tear sheets are available upon request.

By Ernest E. Zideck

Instructor, Technical School, Jackson, Michigan

IN the series of operations that follow one another in the orderly fabrication of a sheet metal article, it is necessary to include abrasive and other finishing. An understanding of finishing is necessary, because a general knowledge of work required in finishing will tend to restrain the shear men, the provisioners, the formers and first assemblers from scratching the metal and warping or otherwise marring its smooth surface; and prompt the binders, the spot and other welders, solderers and brazers respectively, to do their particular work so as not to add, unnecessarily, to the cost of finishing the product.

In the old days, when sheet metal work consisted mainly of seaming and soldering, seaming which was done so smoothly as to leave the tinned or galvanized metal without scratches and deformities, and soldering was done with least possible trace of solder remaining visible along the seam. On zinc or copper utensils, for instance, the solder was scraped off and the joint finished with fine emery cloth. Nowadays the procedure is repeated in "stainless" steel constructions.

Welding Has Made Finishing Problems

In contemporary sheet metal fabrication of products destined for baked enamel, spot welding and welding has replaced seaming and soldering. And, because under the enamel the least scratch of the metal will show up, and the dots caused by spotwelding will become visible, the men handling the metal and doing spot welding must be doubly careful. Least scratching of the metal in prior operations, will eliminate half of the abrasive work after. And a proper adjustment of the heat in the spotwelding apparatus will eliminate most of the deep marks which the finisher is called upon to bump out and level up and erase. That same precaution in acetylene or arc welding of exposed construction parts will by that much reduce the work of the finisher and render the production cost of the item so much lower.

In the production of competitive sheet metal

wares such as cabinets, auto bodies, office furniture and such like, which must be smoothly and attractively finished to be competitive (to sell, in other words), each worker in the long chain of operations is equally concerned with getting out the product as well looking as possible, with the costs of production being a minimum. All the workers should be concerned about this phase of their work because, producing competitively, their jobs will be progressively more secure and more paying; but if the workers are unconcerned and working carelessly, the costs of production mount because of their carelessness, their products may not come out as attractive as others, the costs may be too high to stand comparison with others, the goods may not sell, the shop or factory may be forced to close.

Good Machine Work Reduces Finishing

In the training of men for sheet metal work, the above problem of impressing the students with the need for work being done considerately and with elimination of avoidable trouble or more work for the next operator should be included and stressed. It is the instructor's duty to prepare the young men being trained for sheet metal work as it must be done under our modern conditions. Under the emergency program, the young men should be impressed with the necessity of doing each single operation, each small item of work, with utmost care and with elimination of trouble for the next worker. Right now the workers leaving training are being employed in the fabrication, among other, of army and navy aircraft. Drilling, riveting, welding and other work is being done in quantities. Men leaving the class room without proper education as to the importance of the hole they drill, the rivet they insert, the weld they do, might be the cause of the plane crashing, causing deaths. Plant inspection can not attend to each single operation, can not penetrate the weld, for instance, and if the worker himself does not understand the need for

each item being done WELL, supervision seldom is able to impart the spirit.

On the other hand, men trained for work in shop or factory engaged in competitive production, should also receive instruction as to the business phase of doing work for a contractor or a manufacturer. More and more are we shifting toward cooperation between employer and the employee's associations or unions. But how can the worker "cooperate" if he lacks the insight into the business part of the contracting or manufacture, stubbornly demanding a higher rate of pay, but incompetent of thought of "how the money that pays his wages must be made." Such uninstructed workers become the prey of unscrupulous labor leaders who run the respective unions as it pleases them, often as a racket, and often in imitation of a dictatorial mind's whims. Nowadays, in training men for a trade, it is also necessary to train them in at least the rudiments of economy, of how work produces usable goods and their placement with the user produces the money that pays his wages.

Poor Machine Work Raises Finishing Cost

The lack of appreciation of the above, the composite comprehension of WORK, has tended in the past to increase the costs of the "finishing of sheet metal assemblies" disproportionately to the cost of preparation of the assemblies. Sheet metal parts delivered for finishing showed deep and numerous scratches in the metal surface, formations showing unsightly traces; rib formations in the metal; spotwelds which burned the metal or left deep cavities due to the joint not closing tight or the piece held wrongly in the spotwelder; acetylene or arc weld piled up over burned or not fused metal—these operations indicate the mechanic had no thought whatever to the troubles ensuing or the cost of work required to passably "finish" the output.

It has been a common experience in many shops doing abrasive finishing in preparation for enameling or other such lustrous coating of the metallic goods, that the thoughtless and careless handling of the metal parts in formation and pre-assemblies has DOUBLED the cost of labor that went into making and preparing the product for paint finishing. The doubling of the cost of labor showed up in the abrasive finishing department, where grinders, bumpers, wheel operators, rubbers and others sweated to erase as much as possible the DAMAGE done to the metal in preceding operations. In many cases the burned or rod-covered weld was exposed in finishing, the assemblies returned for re-work, delays and unproductive work piling up.

Abrasive Finishing Technique

Abrasive finishing consists of work performed by means of diverse grinding and rubbing-off apparatus, the so-called "jacks" being solidly mounted and their grinding wheels used in

"roughing"; electrically operated hand apparatus, with emery cloth discs rotating over the metal; all kinds of conically and other shaped long-shaft apparatus holding emery cloth or finely ground emery dust glued on cloth shapes; of an assortment of specially shaped hammers and tools used in leveling the metal; of rasps and files; pumice stones and other such tools and means of elimination, from the exposed metal surface, of all traces of work which would appear unsightly under the lustrous coating of paint.

Abrasive finishing, like any other kind of artisanship, may be taught in the school, acquainting the student with the tools and means used, with their application in this or that task, with the processes of doing the work on flat sheets of metal, on spotwelded joints, on welded joints, on the metal marred in forming or other former processing. Finishers, if they know their work and apply themselves to it, are well paid help in any sheet metal shop making goods which, ultimately, are finished by baked or sprayed (dry) painting.

Solder "Fill-in" Spoils Enamel Coat

Previous to the introduction of the "baked" enameling finish, many of the metal finishing tasks were done by filling the cavities in the metal and the unsightly joints with SOLDER. Plumbers solder, the 30-70 kind, was used, and the solder was applied by a cloth or a stick, same as the plumber used to do in "wiping" the lead pipe joint. These "solder finishers" were highly skilled men, the handling of the molten solder—wiping it to the smooth finish requiring in addition to a knowledge of how to do it, a long try-out and practice. This mode of finishing still is used in the manufacture of delivery wagons and goods too bulky to be painted through a baking oven.

Solder should not be used in finishing if the product is destined for "baked" painting, because the heat, although lower than the melting point of solder, invariably will cause grooves or marks where the solder contacts; that is, where the solder surface stops and the steel surface begins. These grooves or marks are caused by the unequal expansion and contraction of the two metals under heat. Another reason why soldered finishes should not be baked is the fact that, although the oven heat may be only slightly above 200 degrees, the solder will assume, under the heat, a SANDY surface, which shows under the paint. In baked steel constructions the finishing, pending the invention of a metallic putty adaptable for the purpose, must be done by welding or brazing and these processes should be shunned, because of the high heat necessary, warps the flat metal surrounding the weld or braze.

The difficulties inherent in the work we here call "abrasive finishing", should move the instructor in sheet metal work to teach his young men to do sheet metal work that calls for a minimum of "finishing". Comprehending, from the

beginning, the inter-relation of the operations and why this or that task should be done in a certain way and not haphazardly, the learner will be guided in all his acquired work-capability by this understanding, and will be that much more competent to do the work.

In this Series of "Streamlined Training" we started out with emphasis put on "operations", beginning with the planning of work, layout, shearing, provisioning, forming, joining, and completing with finishing. It is undoubtedly true, especially so in the now prevalent National Defense work, that the worker, be he of the old-time full-trade schooling or be he one of the recent trainees, is now employed doing one operation instead of all of them. It is so, because in quantity production necessary, the workers each building his individual structure from beginning to end, would cause a confusion in the shop, clogging the machines, one waiting for the other, each consuming untold time setting the gauges, each wandering about in search of the proper tool, each being extremely busy the whole day but accomplishing very little. On the other hand, the "streamlined" procedure puts each man in his place, he stays at his own machine or tool all day, does one identical operation the whole day long, acquires efficiency and speed doing it, feeds the man at the next machine or tool with constantly flowing, well fitting parts, the shop is orderly, all men are engaged in purely productive movement, production flows "like a stream".

Learner Can Continue Education

At that, the learner who operates a machine after a scant three months training period does not need to stop there. He can attend evening classes and there learn the other operations, one by one, until he knows them all and has his choice, in the factory, of what he wants to do. He may be switched, in the factory, from one operation to another, until he has mastered them all. If, in the postwar times to come he should apply for

work in the conventional sheet metal shop (which by that time will have undergone radical changes, no doubt), he might prove a more efficient "general sheet metal worker" than was the mechanic of old.

In this series the writer has endeavored to impress the instructor primarily, with the vast amount of "instruction material" with which to deal; and has shown how, under the emergency, trainees may benefit by learning one operation first, go to work at regular wages and, if they want to learn more, come back evenings and absorb more and more until they have learned all.

Machine Operators Replace Thorough Mechanics

In the beginning of the present emergency it was maintained by many that, in sheet metal work, it is impossible to teach other than the "whole trade" as outlined in the books on the subject. The thousands of trainees who have left school for shop and factory meanwhile, doing either shearing, provisioning, braking-forming, fitting-joining or one of the other operations and nothing else, have sufficiently demonstrated to the contrary. And since the young men of today decline to serve an apprenticeship lasting years in order to be able to work in a sheet metal shop, the trade will have to modify its orthodox views in that respect and, if it wants young men to take up sheet metal work, it will have to adapt itself to changed conditions and foster in its trade schools the teaching of "operations", employing the young man, at a full wage, doing the operation; laying him off when the operation is completed; re-hiring him for future such operations as needed; always on the lookout for men who, while doing one kind of work are learning to do other work, these men finally competent to step from machine to machine and handle any tool, fit to do sheet metal work in the shop, on buildings and in the other spheres to which sheet metal work constantly branches out.

McCarthy's 1874-1942 *(Continued from page 63)*

in from a truck is doing a larger volume each year. The well equipped sheet metal shop is still active, but the monumental sheet metal contracts of a generation ago are few and far between. Application of built up roofing is also one of the activities of the firm.

During the summer and fall of last year a telephone solicitation was made to every name in the Vincennes directory for furnace cleaning. McCarthy's offered to clean the furnace, take down smoke pipe and adjust controls for \$2.95. Another service consisted of cleaning the furnace,

taking down smoke pipes, cleaning and oiling the stoker, painting the hopper and running oiled sawdust through the worm for \$4.95.

Cleaning is handled by one man in a truck and at the time of cleaning an inspection is made of the furnace. If repairs are indicated, an engineering report with a layout is presented if alterations or improvements seem beneficial to the customer.

This diversification of activity, McCarthy reports, has kept the organization busy and profitable.

Where trustworthy tools are vital



Photo Courtesy Caterpillar Tractor Co.

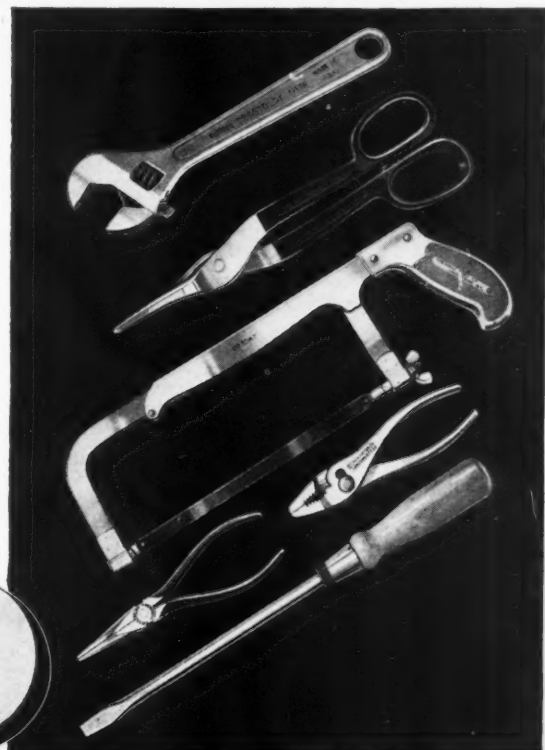
The roads of a nation are the essential arteries through which its life blood flows. In times of war, they become vital networks in the whole defense scheme.

Millions are being spent on these roads today — dollars that go further because of efficient road machinery and modern tools. Wherever these new trails are being blazed, you'll find Crescent Tools helping to open up the way.

Crescent Tools include adjustable wrenches, pliers of all types, hacksaws, snips, screwdrivers, etc., etc. They are sold under the "Crescent" and "Crestoloy" trade names by hardware and industrial distributors everywhere.

CRESCENT TOOL COMPANY, JAMESTOWN, N. Y.

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Give Wings to Work





"Healthy screws gave us Two-way Savings ON THIS BIG HOSPITAL JOB..."

says Henry J. Borchert, Consolidated Sheet Metal Works, Long Island City, N. Y.



**"Again, our cost sheets show the difference
— We've saved time and money by using
only PARKER-KALON Sheet Metal Screws!"**

New LEBANON HOSPITAL, Bronx, N. Y.

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"It's costly and time-wasting to try to do a good job with screws that can't take it," says Mr. Borchert of Consolidated. "We tried other sheet metal screws but they just didn't work like Parker-Kalon. Now P-K is standard on all our jobs . . . we wouldn't use anything else. They save time and money because they go in without trouble and do a job that is right!"

Parker-Kalon Sheet Metal Screws come up to "specs" every time . . . that's what thousands of sheet metal

men are saying. And for good reasons, too! Parker-Kalon invested thousands of dollars to set up a Quality-Control Laboratory which checks everything from wire to finished screws, to make sure every P-K screw is a *good* screw. Every test and every inspection in this thorough Laboratory is designed to protect your reputation for good work . . . and help you make a profit on every job.

On your next job, specify Sheet Metal Screws made by Parker-Kalon Corp., 190-192 Varick St., New York.

SOLD ONLY THROUGH RECOGNIZED DISTRIBUTORS

PARKER-KALON
Quality Controlled
SHEET METAL SCREWS

COSTS NO MORE

*to get the Parker-Kalon
Quality-Control Guarantee
with every box of . . .*



Hardened Self-tapping Sheet Metal Screws

Sizes and head styles for assembling light and heavy sheet metal.



Hardened Screwnails For fastening sheet metal to wood securely.

Hardened Masonry Nails

For fastening to brick, mortar and concrete, etc., easier and quicker.



President-elect Harold S. Sharp.

N.W.A.H. & A.C. Ass'n's

28th Annual Convention

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THE 28th annual convention of the National Warm Air Heating and Air Conditioning Association held in Philadelphia, January 27 and 28 had much of the flavor of Washington—the addresses were delivered by individuals directly connected with Washington agencies or by individuals representing our industry in Washington; Committee Activities and discussions reflected the influence of Washington on our affairs; and even the technical reports dealt in a large measure with problems resulting from Washington requests for help.

1942 Building Prospects

Thomas F. Holden, President, F. W. Dodge Corporation, reviewing briefly what our industry may expect stated that overall volume of construction, 1942, will about equal 1941. Everyone, said Mr. Holden, quite likely will be very busy throughout the year. The warm air heating industry is in a favorable situation because—1) our product and services are essential to war pursuit; 2) we do not have the problem of shifting completely from one type of manufacture or installation to another.

Retail establishments may find the going pretty

rough, said Mr. Holden, and while the manufacturers of absolutely non-essential metal products may find their activities greatly curtailed, it is possible that even such producers may be able to shift some peacetime activities to production of war requirements. Where it is not possible for an individual manufacturer to make this shift, Mr. Holden suggested we may find the pooling of shops, equipment and resources a satisfactory method of obtaining subcontracts.

Citing the tremendous dollar volume of materials we are expected to produce, Mr. Holden believes there will be a large carryover from 1942 to 1943. Whereas the most spectacular feature of the 1941 building record was new defense industrial construction (the largest ever), it seems that 1942 will witness three major activities, as follows:

1—Direct army or navy construction of camps depots, posts, etc.

2—Storage facilities for war goods ready for shipment.

3—Housing.

The worst that can happen to our industry opined the speaker, is a reduction in residential building dollar volume of approximately 40 percent or a reduction of approximately 20 per cent in housing units as compared to 1941, but no one is now able to predict whether enlargement of the war program may be called for and all such enlargements may require additional housing.

Certain agencies in the government are planning for a post-war construction program which quite likely will include a tremendous program of house construction to meet deferred desires, additional public works which are temporarily shelved, and construction of heavy engineering projects. If these present plans materialize, the long range volume picture for all industries having to do with construction looks very favorable.

We Must Gear Ourselves with Washington

President C. A. Olsen offered the encouragement that this industry and its manufacturers, jobbers and dealers have met all problems during the 28 years of association existence and there seems to be no good reason why the industry cannot continue to meet all problems presented by war activities. Our many years of research and engineering advancement in design of products and installation has placed the industry in the position of being able to contribute definitely to the war effort at the same time temporarily shelving many of our standard practices and substituting therefore emergency practices.

Declared President Olsen, we should not expect Washington agencies to accept our standard products and practices where these conflict with definite requirements; we should, instead, be willing to do just

as much as we can to meet Washington requests. So far as 1942 looks now, President Olsen said he believed there would be two large major markets—army and navy requirements and the small defense house heating field.

No Time for Recriminations

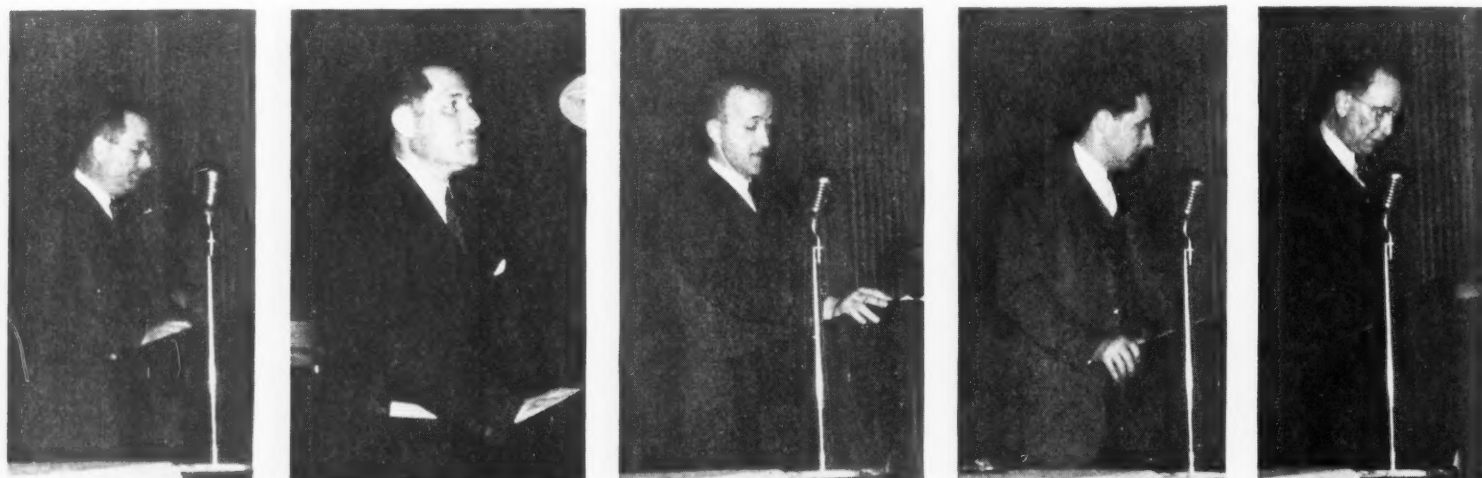
E. Budd Marter, representing the National Manufacturers' Association, said the feeling of his association was that today is no time for recriminations on what might have been done, but is, instead, a time when everyone should be primarily interested in getting the job done as quickly as possible. Roughly, the problem facing American Industry is the production—each month—of 2,000 planes, 2,400 tanks, \$800,000 worth of machine tools, and 6,000 ships.

To meet this tremendous program, Mr. Marter suggested that the pooling of products, of factories, of equipment, of employees, should be done wherever this will stimulate production. One thing which has disturbed industry up to now has been lack of labor peace,

of the decisions. Committee members are asked if they have suggestions as to how necessary programs can be put into effect with the least possible dislocation of the industry itself and civilian economy, bearing in mind that the military requirements must be met regardless of the hardships such requirements may inflict on the industry or civilian economy. The Committee then becomes concerned with producing the military requirements as quickly as possible and seeing to it that the quantity of material left over is distributed equitably in the industry so that all plants will receive a share of the business.

Making the most of greatly reduced civilian supply can be achieved: by simplification of design whether of units or complete line; elimination of certain civilian uses less essential than others; reducing the amount of materials used in a finished unit; and any and all additional conservation measures.

While committee members are free to express their individual or collective industry opinions regarding any particular problem, War Production Board re-



Left to right—W. L. McGrath told of work of industry advisory committee; W. Walter Timmis, WPB, explained PD-25A's general aims; William C. McDonald, Housing Priorities Div., WPB, said allocations have been made to insure a fair volume of furnace work; C. C. Honsacker, WPB, went through PD-25A section by section; Mathias Niewenhaus, Defense Housing Coordinator's Office, said we need 500,000 new defense houses.

and only peaceful co-operation by labor can enable industry to meet the tremendous program facing us.

The National Manufacturers' Association believes that we are reaching our present tremendous production through centralized direction from Washington. This centralized direction will not be available when peace comes and the speaker suggested that perhaps trade associations working together may be one method whereby the good things of centralized direction can be maintained while we are regaining our old way of life.

Plumbing and Heating Advisory Committee

W. L. McGrath, Williamson Heater Company and member of the Plumbing and Heating Industry Defense Advisory Committee, briefly described how the Advisory Committee came into being as a request by the Office of Production Management for Industry Committees to advise and work with OPM. The function of an industry advisory committee, explained Mr. McGrath, begins when the material commonly used by that industry becomes scarce. There are at present some 30 of these advisory committees co-operating with the War Production Board. These committees are advisory only; War Production Board makes all

serves the right to make the final decision. Committee members serve without compensation and travel without expense reimbursement. Mr. McGrath stated he is convinced Washington fully recognizes the importance of the products and services of our industry as essential to the general welfare of the public and also essential in additional public housing.

Suppliers' Order M-67, said Mr. McGrath, gives definite assurance to the public, producers and suppliers that heating supplies will continue to be available for repair and maintenance purposes; also complete new units of equipment to be used where existing equipment is beyond the state of reasonable repair; materials furnished under M-67 should not be used for modernization nor for unnecessary improvement of existing equipment. So far as the manufacturers are concerned, the new form PD-25A should open the door to material supplies within reasonable limits if the individual producer will divert such materials in the form of finished products into channels carrying preference ratings or essential civilian needs.

The most productive channels into which the products of our industry may be directed according to Mr. McGrath are

1—\$600,000,000 have been appropriated by Congress to build thousands of homes for defense workers.

2—A substantial number of barracks for housing the military forces is scheduled for early construction.

3—A substantial number of privately financed homes for defense workers in defense areas should be built under the authorization of FHA and conforming to the requirements of Order P-55 as recently amended. P-55 enables the owner of an existing residence to convert from single family to multi-family apartments.

4—Servicing, repairing and the maintenance of existing heating equipment.

Bearing in mind, said Mr. McGrath, that the demand for war materials continues to grow, every manufacturer should offset diminishing volume from customary trade channels by adjusting manufacturing facilities to handle at least some product entering directly into war needs. Also, there never has been a time when record keeping was so important and the extent to which the dealer and the jobber is able to show to the manufacturer that his product has moved into channels considered essential by Washington will circumscribe the manufacturer's being able to procure materials, replacements, and thereby continue to serve his dealers and jobbers. Every producer and jobber should be in a position to justify his existence and should classify his sales so clearly and so accurately that records which can be sworn to can be produced to show the extent to which his operations are necessary to defense and essential civilian requirements.

Emergency Committee Warm Air Industry

I. L. Jones, Chairman, Emergency Committee of the Warm Air Furnace Manufacturing Industry, stated that the government's early conviction that common labor rate ought to be the same for all manufacturers of furnaces regardless of geographical location has now been changed to acknowledge the difference in wage rate in different areas of the country. The emergency committee also reviewed early FWA specifications for defense house furnaces and made recommendations which in general Washington has considered carefully. At the present time, this committee is the go-between for Washington agencies and groups of manufacturers in our industry.

Simplification and Elimination of Waste

John K. Dougherty, Lamneck Products Corporation, speaking on "Simplification and the Elimination of Waste" pointed out that during the emergency, with material scarcities confronting every manufacturer simplification and elimination of waste is more essential than ever before. Allocation of raw materials if, as and when accomplished, must be confined to essential items alone.

Mr. Dougherty pointed out that since M-67 definitely limits the volume of inventory a jobber can carry, it behooves each jobber to keep his inventory as fluid as possible—items which do not turn over frequently should be eliminated.

Our industry simplification committee has prepared and is working on tentative schedules which greatly reduce items in stocks of registers and grilles; furnace pipe and fittings; etc. What can be done in the way of simplification was dramatically pointed out by Mr. Dougherty who said that originally there were 2,663 gravity pipe and fitting items and of these 2,035 or 75% can be eliminated; of 2,917 items for forced air duct and fittings, 2,335 items or 80% can be elim-

inated; of 473 types and sizes of registers (not style) 387 types and sizes or 82% can be eliminated.

The Housing Program

Mathias Niewenhaus of the Defense Housing Co-ordinator's office briefly described the defense housing co-ordinator's bureau as the correlative agency over FWA, USHA, LHA, PBA, DDA, FSA, TVA, and army and navy construction. The basic concern of the co-ordinator's office is this: That no defense industry worker shall be unable to find adequate and satisfactory housing. The defense housing Co-ordinator's office hopes that in 1942, at least 400,000 of the 525,000 units needed will be built by private capital. To this will be added approximately 125,000 to be built by public funds under circumstances which the government can not expect private lending agencies to finance. The government, said Mr. Niewenhaus, expects to buy large quantities of equipment made of scarce materials, and this includes furnaces, circulating heaters, floor furnaces, stoves, etc. The Procurement Department of the Treasury will do the actual purchasing. Washington believes this mass purchase will insure materials for the housing construction required and will also tend to provide a steady year-through production schedule for manufacturers. Ability to perform contracts and geographical distribution of contracts will be used to spread production of the items mass purchased as widely throughout the country as possible.

Housing Now Subsidized for First Time

Bruce Wilson, Motor Wheel Corp. declared that if we really do build 400,000 houses privately financed in 1942 every small heating contractor certainly should be busy. Mr. Wilson made the point that mass construction of housing units marks the first time government has subsidized an industry connected with housing. Subsidies in the form of land grants were given the early railroads; subsidies in the form of a half-million miles of concrete highways were given to the automobile industry; farmers have always been subsidized in one way or another; and now, through mass purchasing and financing applied by HOLC, FWA, PBA and other agencies, the government has finally stepped in and through this form of purchase and construction is making available to very small wage earners housing which they could not obtain if private capital had to finance construction.

Mr. Wilson pointed out that 76 per cent of all American families earn less than \$1,500 a year and so can pay only \$25 to \$30 a month for rental or to buy. In the past the construction industry has completely ignored this class of prospective home owner and 75 per cent of all houses built for sale have been priced so that only 8 per cent of our wage earners could reasonably afford to buy these houses.

What the public actually wants in a new home is four and one-half or five rooms; a white house with green blinds; a pitched roof; and a picket fence. What actually goes into the house as heating equipment doesn't seem to matter. Heating systems are pretty much like the carburetor of an automobile engine—absolutely essential, but not very completely understood by the purchaser. Mr. Wilson's conclusion was that if this subsidy by government of small, cheap houses carries to its ultimate conclusion, we may expect to see the building of two or possibly three million new homes a year.

Allocations Will Ease Purchase

William C. McDonald of Housing Priorities Division of WPB offered the encouraging information that at last quotas of materials have been set up based upon the co-ordinator's survey of housing needs in defense areas and an allocation of scarce materials has been made and it is quite possible that materials will be easier to obtain. Not so encouraging was Mr. McDonald's statement that a new list of critical materials will soon be published and that some materials formerly not critical will be marked critical on this list. Mr. McDonald briefly reviewed former procedure under which the priority granted a builder was extended to the contractor and in turn to the supplier and in turn to the manufacturer and to the raw material producer. He then explained present procedure for maintaining inventory in accordance with M-67 up to the jobber and PB-25A from the manufacturer to the manufacturers' supplier.

C. C. Honsacker of War Production Board explained Schedule PB-25A in detail, emphasizing those sections which are particularly important to the manufacturer and to the supplier.

Peter L. Schauble, also of WPB, in charge of sub-contract distribution in the Philadelphia area, explained how the contract distribution office was established and what it has done to break large contracts into numerous small contracts. What is needed now, the speaker declared, is for every manufacturer, no matter how small, who has either space or equipment, to register with his local sub-contract distribution office and determine whether or not there are products which he can manufacture. Pooling of small plants and their facilities was suggested as one means of obtaining sub-contracts where no one manufacturer in the pool could expect to handle a sub-contract by himself.

Timmis—The Maintenance Problem

W. Walter Timmis, Chief of the Plumbing and Heating Branch, WPB, explained how OPM was originally set up as a functional organization wherein one department served all industry with the result that one branch of OPM might conflict with other branches of OPM. Under the new organization, by industrial groups, each group is complete in itself. It is hoped, said Mr. Timmis, that WPB, under Mr. Nelson will rapidly clean up all problems of conflicting supervision.

One of the biggest problems confronting WPB is the amount of raw materials which should be set aside for the production of end products needed to meet the nation's requirements. Whereas it was comparatively easy to reduce production of radios to 20 per cent of 1941 production, it is not quite so easy with housing and material required to construct houses because housing is essential and so materials and equipment needed in these houses must be provided. Washington, said Mr. Timmis, now accepts that existing heating standards must be maintained. The trouble is that every week the housing requirements seem to be boosted. If army and navy would definitely state how much war material they require for their program, it would then be fairly easy to allocate certain quantities of scarce materials to all of the other industries wanting these materials. Maintenance requirements for scarce materials has been and still is a problem, said Mr. Timmis, because so much of so-called maintenance has in reality been improvement or betterment. WPB does not believe existing

heating systems should be bettered, but should be maintained as is, or repaired to equal present condition.

Mr. Timmis urged all manufacturers to file as soon as possible their first PD-25A schedule. WPB is also concerned, according to Mr. Timmis, with simplification of products used by each industry—not such simplification as has been practiced by the Bureau of Standards—but streamline simplification which absolutely eliminates all products not completely essential. Simplification, it is hoped, will conserve every pound of every scarce material during the duration of the emergency.

Reporting for the Code Committee, W. P. Redrup expressed the belief that the gravity installation manual was probably the committee's most important contribution in 1941. This gravity manual has proved so effective and so satisfactory to the industry that the code committee is now contemplating a similar manual to cover forced warm air heating.

Konzo—Barracks Heating Problems

Professor S. Konzo, briefly reviewed the importance of the Standard Code Application Manual in the present campaign to simplify design and installation and urged contractors and manufacturers to become familiar with and to use Table 5 of the manual, because from now on, these register sizes and pipe sizes will probably be insisted upon by WPB and the housing agencies. Likewise Table 2 and Table 3, showing warm air carrying capacities in Btu delivered for first floor and second floor registers will also be used. When understood these tables will greatly simplify engineering design.

In Prof. Konzo's opinion, the multi-family housing structures erected under the Lanham act are pretty good construction and the deficiencies seem to be of a minor nature. Duct systems are fairly good in most of the houses inspected and for \$150 the government has purchased a pretty good heating plant.

Some interesting departures from present practices now under consideration were listed by Prof. Konzo as:

1—On the largest units the net hourly bonnet heat output of the furnace is to be 66 times the floor area or 80,000 Btu, whichever is smaller.

2—Sizes of furnaces to be limited within three brackets: up to 50,000 Btu output; 50,000 to 65,000 Btu output; 65,000 to 80,000 Btu output.

3—Efficiency ratings to be considered as 75% for gas, 75% for oil, and 110% for gravity coal-fired furnaces. Prof. Konzo explained the 110 per cent coal gravity efficiency rating as based upon the fact that heretofore, we have included additional safeguards which can now be disregarded.

In furnaces for army barracks work Prof. Konzo said recommendations now prepared suggest furnaces to be constructed as follows:

Up to 2.75 square feet of grate area: heads to be 8-gauge, sides to be 10-ga., radiator to be 14 ga.

Up to 6 square feet of grate area: heads to be 6-gauge, sides to be 7-gauge, radiator to be 12-gauge.

Over six square feet of grate area: heads to be 3-gauge, sides to 3-gauge, radiators to be 12-gauge. Radiator gauges also apply to bottoms.

Most of the troubles with army camp heating could easily be corrected if manufacturers of equipment will furnish brief periodic check-ups to see that equipment is functioning properly. It has been proposed that

(Continued on page 93)



Officers and Directors for 1942. Seated, left to right—Vice President Phil Cordes; President Frank G. Sink; Director Elmer Mullin; Secretary Homer Selch. Standing, left to right—Treasurer Thomas Ewing; Directors E. L. Carr, C. C. Sieb, Chas. Gatz.

Indiana's Zip-Zip, One-Day Convention

THE effort of the Sheet Metal and Warm Air Heating Contractors' Association of Indiana to streamline their 1942 convention to a one-day, to the point, meeting was, in the opinion of everyone present at Indianapolis on February 3rd, definitely successful.

Today's Problems are Difficult

Frank G. Sink, Vice President in 1941 and elected president for 1942, made a plea for a membership campaign during 1942. The small membership today is a challenge to every member, lets build it up, said Mr. Sink. A survey made in 1929 showed that there was 1,100 sheet metal, warm air heating, oil burners, and stokers firms in Indiana employing approximately 6,000 mechanics; there probably are as many, perhaps more firms now; if the association can build a fair representation, the association and the firms in the industry should be able to keep shops busy by working for legislation, labor control, contracts and standards which the industry considers necessary.

It may be that we will go back to ideas of forty years ago: in 1900 we did not use return duct, but trenches underneath the floor; brick casings were used more frequently than steel casing and the brick casing was \$10 higher in price; most customers wanted brick casing instead of steel casings. When an owner wanted a furnace installed or repaired, he came to the tinsmith and explained what he wanted done—today, you have to go out and do a job of selling to find the prospect and make a sale. In 1900, when a job was completed the customer came in and paid his bill—today, you have to watch your accounts like a hawk or you will find outstanding accounts which become more and more difficult to collect.

President Sink suggested that every Indiana shop should carefully consider the possibilities of obtaining sub-contracts and every man should try to invest at least one-half of his savings in defense bonds.

Roofloy—To Replace Copper

J. M. Kittleman, Revere Copper & Brass presented Roofloy, a lead-alloy sheet priced approximately two

cents per pound higher than the cost of copper by weight and suitable for roofs, flashing, water drainage work on houses or mercantile buildings.

Roofloy is comparatively light in weight, compared to former lead sheets, and that the small percentage of alloys added to the lead reduces creep or sag and increased its tensile strength. Whereas older forms of lead sheeting used to sag or run under high temperatures, the alloys added in Roofloy prevent this sagging to a very large extent. So far as weathering characteristics are concerned, the new alloy sheet compares very favorably with the very heaviest, pure lead sheets formerly used. An advantage is that customary roof framing can be used in place of the extra heavy framing required for older forms of lead roofing.

Up to a short time ago Roofloy was completely free of priorities and was not on the scarcity list, but lead has now been placed on the scarcity list and Roofloy is not completely available from all jobber's stocks. Sheets are made in practically all sizes common to copper roofing sheets. Roofloy has met government specifications for defense housing and defense building flashing so the contractor can feel safe in using this new product wherever lead or copper or steel was formerly used.

The Washington Picture

J. D. Wilder, AMERICAN ARTISAN, reporting on the latest Washington schedules and regulations affecting contractors, jobbers and manufacturers explained briefly PD-25A, an inventory form under which manufacturers obtain raw materials for the production of furnaces and M-67 jobber's inventory control under which jobbers maintain stocks in accordance with the percentage of items sold classified as essential defense products. Mr. Wilder emphasized that while many people seem to feel there is much inefficiency and lack of understanding throughout Washington agencies, the truth seems to be that the men throughout the agencies are men of high purpose, in sympathy with the problems of the industry, but imbued with a driving desire to see this thing through as quickly as possible.

One point of confusion in housing is the frequently quoted figure of approximately five hundred thousand new housing units needed for defense workers in 1942. Of this number government will publicly finance 43,000 demountable houses, approximately 80,000 multi-housing units of the two, four and six-family barracks type building, and private capital will build the remainder. The 43,000 demountable houses will be heated by floor furnaces and circulating heaters. The multi-family barracks buildings will be heated as in 1941 with floor furnaces in the single story buildings and with PBA-18 type furnaces in most of the housing units.

At the present time, the home building agencies such as FWA, FHA, PBA, TVA and others have been assured by Donald Nelson of WPB that metals required for these houses have been definitely allocated so that 200,000 housing units can be built immediately with the assurance of obtaining all necessary materials.

An allocation of material has been made for 200,000 units, but it is expected that when the 200,000 housing unit program gets well under way, an additional allocation will be made for the other houses in the 500,000 requirement.

Agencies having to do with heating in housing are not following identical programs, said the speaker, in describing ideas to reduce the amount of material required in heating systems. For instance, the substitution of pressed board for galvanized iron as panning for return runs is not a serious substitution, but when some agencies state that the only material permitted for either warm air or cold air runs will be metal elbows and fittings, leaving all straight sections and stack to be made of substitutes, then such substitution does become serious. The extreme idea is that all metal (including nails and screws) to be permitted in a small house shall not exceed 150 pounds. Still another agency gives their maximum as 500 pounds of metal. It is obvious that any such metal restriction would make it impossible to install any type of furnace in one of these houses and it even becomes doubtful if a floor furnace or a circulating heater could be used.

To picture the effect of curtailments, the speaker cited an example of the contractor who ordered a furnace and the necessary galvanized iron for an installation, requesting ten sheets of iron but was given only two sheets. The contractor did not believe the system could be installed with two sheets but the job

was put in, placing return grilles on inside walls; making each warm air run just as short as possible; using substitute material for return panning; and the two sheets plus some extra fitting already in the shop did the job. Washington demands that every contractor, jobber, manufacturer, make every effort to simplify and standardize design and installation to the end of reducing amount of critical materials required. The industry, said the speaker, surely has the ingenuity to do this job if we stop complaining and hoping for a solution and get down to business.

The march of the floor furnace northward and the increasing use of circulating heaters by government agencies is perhaps beyond the control of the warm air heating installer in publicly financed construction, but where this type of unit is suggested by the private builder or architect, or owner-builder, the contractor should point out that if the furnace is not automatically controlled, air and grille can reach a temperature of 350 to 425 degrees, which is definitely harmful.

Sub-contract Progress

Frank Hoke, State Director of contract distribution for the State of Indiana, outlined the problems and purposes of the contract distribution division. The goal of all contract distribution, said Mr. Hoke, has been summed up by Donald Nelson who said that if every industry in America, including the smallest firms capable of manufacturing, will all put their shoulder to the wheel we may be able to win the war speedily, but if we do not all contribute our bit, the war can take ten years to finish.

The purpose of each local contract distribution office is to provide information on how to obtain sub-contracts from prime contractors or the government and also provide prime contractors and the government with names of firms capable of manufacturing the product wanted. Government is now driving to break all contracts up into smaller and smaller parcels to get war industry items manufactured by more and more and smaller firms. At the present time, contract distribution offices are working directly with some 60 different government buying agencies.

In each contract distribution office, there are engineers capable of interpreting blueprints and specifications to prospective manufacturing firms. These engineers can also make complete surveys of the facilities



Left to right—President Frank Sink asks each man to invest half his savings in defense bonds; Revere's J. M. Kittleman described Roofloy as a war time material; Frank Hoke, State Director of Contract Distribution, said getting war contracts calls for just as hard selling as any peace order; A. F. Frazee, Dowagiac Steel Furnace Co., outlined some short-cut engineering methods suitable for times like these.

of a plant and to advise with the manufacturer what products he can make. Any contractor wishing to obtain war contracts should bring to his local contract distribution office a complete report of his facilities showing what machines he has, by name and model, what tolerances these machines can work to, what is the immediate and potential labor supply by trades, and from this facility record, the local contract distri-

Upper right—H. E. Rhein (Grant Wilson), G. A. Voorhees (Hall-Neal), contractor Ralph Mullin pause for a "quickie." Lower, left—J. J. Moran (Baker Plumbing & Supply), A. A. Nemec (Nemec Supply), Harry Beaman (Front Rank).



bution office can judge whether or not a manufacturer seems eligible and approximately what he can manufacture.

Mr. Hoke emphasized again and again throughout his talk that the government does not intend to plead with the manufacturer to take a war contract. Quite the contrary, said Mr. Hoke, it is just as necessary for the prospective manufacturer to make a strong sales presentation of his potential capacity as it is to make any peace-time sale.

Short Cut Engineering

A. F. Frazee, Dowagiac Steel Furnace Company, presented an interesting discussion of short-cut methods of engineering. The purpose of all such short cut engineering, said Mr. Frazee, stems from the fact that we all want to stay in business and we all feel sure that heating is essential, but as houses get smaller and prices get lower, there is less and less margin for intricate engineering. At the same time we want to feel sure that the short cut methods used will insure adequate heating.

Mr. Frazee assured the contractors that the warm air manufacturers seem able to meet all needs for at least six months to come. We are finding prospective home builders becoming frightened and we also find ourselves up against the hard fact that we cannot ignore government influence on everything we do in business today. We do not like to feel that our 20 years of research must be completely discarded and more and more frequently we are finding ourselves in disagreement with some of the things government agencies wish to have us do. If some of the things government insists upon come about, we may shortly find ourselves confronted by hazardous standards of product manufacture and installation.

Introducing a number of short-cut formulas to arrive at Btu heat loss, furnace capacity required, fan



In center—Seated, Bob Renick (Indianapolis Machinery) and contractor H. W. Meggs of New Castle. Standing, left to right—George Joslin (Tanner & Co.), John M. Milner of Culver, W. H. Cloud of Peru.

capacity required and duct sizes, Mr. Frazee showed on charts several short-cut formulas which he did not completely approve, but went on to show formulas which do stand up under inspection. For example, a short formula for determining the heat loss of a residence is:

$$\frac{\text{Cu. Cont.} \times 4 \times 70}{55} = \text{Btu Loss}$$

4 = four air changes for air circulation.

70 = the room temperature.

55 = the number of cu. ft. of standard air one Btu will raise one degree.

$$\text{A short formula for determining cfm is } \frac{\text{Btu}}{75} = \text{cfm}$$

Where:

Btu = the total heat loss of the structure

75 = the Btu per cu. ft. of air delivery at 140 deg. register temperature.

Example: (0° Outdoors).

First Floor—Cu. Cont. = $24' \times 40' \times 8\frac{1}{2}' = 8,160$

Second Floor—Cu. Cont. = $24' \times 40' \times 8' = 7,680$

Total Btu = 15,840

Then:

$15,840 \times 4$ (air change) = 63,360

$63,360 \times 70$ (room temp.) = 4,435,200

$4,435,200 \div 55$ (cu. ft. per

Btu) = 80,640 Btu

$80,640 \div 75$ (Btu per Cu.

Ft.) = 1,075 cfm

$80,640 \div 25\%$ (heater in-

crease) = 100,800 Net Heater Load

To demonstrate just how cheaply some of the public housing heating installations are going, Mr. Frazee showed plans of a TVA project two-bedroom structure, with five warm air and one cold air face, where the duct cost was \$30 and on 4,000 jobs were installed at \$18 for each duct system. The government is obtaining duct systems for \$8 to \$10 per opening, which means that contractors have to fabricate and install at approximately \$6 per opening to show any profit.

Mr. Frazee also read a letter from Professor S. Konzo of the University of Illinois, in which Professor Konzo pointed out that conditions are likely to be very tough and that the following things may be expected.

1—No more galvanized iron for duct work.

(Continued on page 95)

Philadelphia's New Heating Ordinance

After months of study, Philadelphia has adopted a warm air heating ordinance. Philadelphia's ordinance is unusual in that the ordinance itself is simply a method of control—what is permissible in design and construction is left to rules and regulations which will be supplementary. These regulations will be taken from the Gravity code and a modified form of the Practical Code. Policing, it is hoped, will be largely done by members of the industry.

TO provide for the general welfare and better protection of life and property by requiring and providing for the examination and registration of persons engaged in the business of the installation, alteration and repairing of warm-air heating, and providing for penalties.

Section 1. The Council of the City of Philadelphia ordains, That it shall be unlawful for any person or persons engaged in such business to repair or to install any warm-air heating apparatus connected with flues or chimney in any dwelling or building in the City of Philadelphia unless such person is twenty-one years of age and has received registration certificate authorizing him to repair or install the same as hereinafter provided for; or to repair or install any such apparatus after the revocation of said certificate until the renewal thereof or during his suspension of his rights so to do.

Section 2. All persons desiring to engage in the business of repairing or installing warm-air heating apparatus shall apply to the Bureau of Building Inspection which bureau shall examine the applicant as to the knowledge of warm-air heating apparatus connected with flues or chimney and as to the character and habits of such applicant with respect to the use of intoxicating liquors or otherwise. Said applicant shall be a fit person and shall have the recommendation of two reputable citizens of the city of Philadelphia, and if such applicant is a suitable and safe person to be entrusted with the installation of such warm-air heating apparatus a certificate of registration shall be granted to said applicant authorizing him for the period of one year to install and repair said warm-air heating apparatus. The Chief of the Bureau of Building Inspection is authorized to adopt such regulations with respect to examination and qualifications as shall not be inconsistent with the provisions of this ordinance. All persons heretofore engaged in said business may obtain a certificate of registration without examination if application is made therefor within one year from the effective date hereof.

Section 3. The Chief of the Bureau of Building Inspection may, upon a proper showing of incompetence or misconduct connected with the duty of

any certified registered person, after notice and hearing pursuant thereto, suspend or revoke the said certificate for such incompetence or misconduct. Such misconduct shall involve intoxication on duty, negligent or unskilled performance of duties or the endangering of life or the wilful violation of the provisions of this ordinance or the regulations promulgated pursuant thereto.

Section 4. Any person who has a certificate of registration for the installation of such warm-air heating apparatus or repairs thereto shall certify to the Fire Marshal of the city of Philadelphia that he has performed the work that he has been engaged to do.

Section 5. Any person whose certificate of registration has been refused, suspended or revoked may appeal from the decision of the Chief of the Bureau of Building Inspection to a Board of Appeal composed of the Chief of the Bureau of Building Inspection, the Fire Marshal and one heating engineer to be appointed by the Director of Public Safety.

Notice of such appeal must be given in writing to the Chief of the Bureau of Building Inspection within five days after the refusal, revocation or suspension of said certificate. Notice of the time and place of the hearing on appeal shall be given by the Board of Appeal to the appellant at least three days prior to the date of the said hearing.

Section 6. The certificate provided for herein must at all times be displayed upon request.

Section 7. All persons engaged in the business of repairing and installing warm-air heating apparatus, at the time of the effective date of this ordinance, shall register and receive a certificate of registration. All persons applying for a certificate of registration shall pay the sum of five (5) dollars. Certificates may be renewed annually without examination upon the payment of two (2) dollars; for any such new warm-air heating apparatus to be installed in any dwelling or building in the city of Philadelphia a permit must be taken out at a cost of one (1) dollar to be issued by the Chief of the Bureau of Building Inspection: Provided, however, That application for renewal shall be made within ninety days after the

(Continued on page 92)

New PRODUCTS

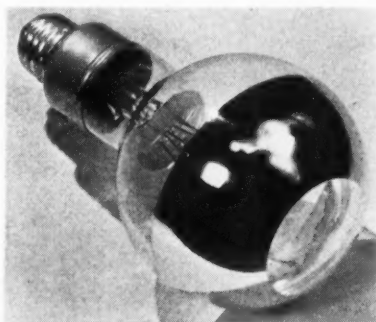
For your convenience a number has been assigned each item. Circle the items in which you are interested on the coupon on page 88 and mail to us.

● Indicates product not listed in 1941 Directory.

△ Indicates manufacturer not listed in 1941 Directory.

△ 1—Infra-Red Tungsten

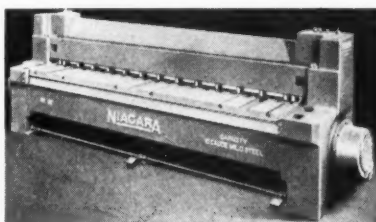
The Birdseye Research Laboratories of the Wabash Appliance Corporation, Brooklyn, N. Y., has announced a commercial type radiant heat lamp. The new bulb is designed to put to practical use for heating what Wabash engineers term "spilled heat" lost in even the most efficient co-ordination of heat lamp and commercial reflector. The new "bullseye"



type of Birdseye heat lamp is distinguished by a ring lining of pure silver sealed inside the bulb at a point just below the focal point of the filament. This silver ring leaves a clear spot through which heat beams are projected from the filament direct to the heating area without spill or loss. All remaining heat rays are gathered into the control area of the reflector by the silver ring lining, and projected down to the heating area.

2—Power Squaring Shears

Niagara Machine & Tool Works, Buffalo, N. Y., announces the addition of another line of power squaring shears designated as Series No. 6 with capacities from 12 ga. to $\frac{1}{8}$ in. with cutting length from 4 to 12 ft.

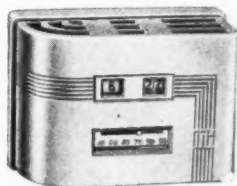


Features include precision cutting, both as to straightness and parallelism, ball bearing, self measuring, parallel back gage with settings to 1/128th inch, speed of 65 strokes per minute, flat, straight shearing of narrow strips.

Drive including flywheel, gearing, clutch, eccentrics and connections, is enclosed and operates in oil.

3—T811 Chronotherm

Minneapolis - Honeywell Regulator Company, Minneapolis, completes its line of clock thermostats with announcement of the T811 Chrono-



therm, making it possible to have fully automatic lowered night temperature regardless of whether Series 10, 20 or 80 control circuits are employed. The T811 Chronotherm is especially adapted to two-wire low voltage circuits.

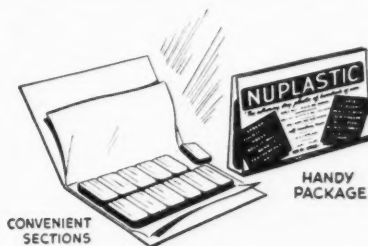
Standard range is 54 to 84 deg F.

Other outstanding Chronotherm features include: a self-starting Telechron motor driven numeral clock; special silver thermostat contacts actuated by a tempered and accurate bi-metal element; adjustable differential; finger-tip adjustment and setting; lock-on cover when desired; and convenient wall mounting plate.

△ 4—Nuplastic

Nuplastic Co., 1711 W. Hubbard St., Chicago, announces a new plastic called Nuplastic.

By hand manipulation tackiness is promptly induced. Moldable to any shape it is readily applied and adheres permanently to any metal including

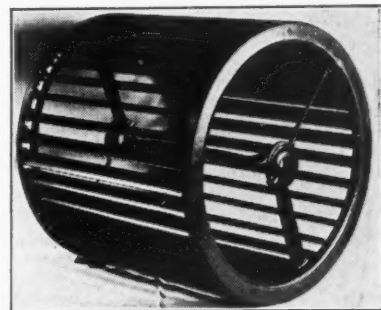


smooth chromed finishes, porcelain, glass, concrete, wood, etc. It possesses high dielectric qualities, contains no solvents, does not crack or shrink, is waterproof, of light color, non-inflammable and does not flow under heat. Pressure leaks may be stopped by applying a sufficiently thick layer to the pipe and wrapping with tape. It effectively seals air leaks in air conditioning, dust collecting and similar pipes.

● 5—Airstream Blower Wheel

Morrison Products, Incorporated, 16816 Waterloo Rd., Cleveland, announces the addition of a 14½-inch diameter Airstream blower wheel to their line. The new wheel embodies the same patented features characteristic of all Airstream blower wheels, the outstanding unique features of which are:

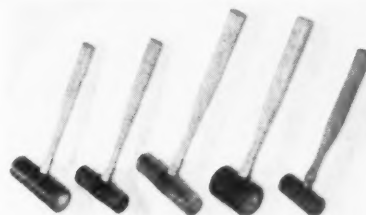
1—Blade section made in one continuous strip from coil stock by a progressive die operation; 2—Channel-shaped end rings insuring a rigid light weight true running wheel; 3—



Patented stamped metal hubs eliminating heavier and more expensive cast iron or screw machine hubs; 4—Induction fan on inlets help to draw the air into the blower 5—Curved inlets to reduce turbulence of incoming air, insuring quiet operation; 6—Mounting the wheel at either end distributes the weight near the bearings, reducing the tendency of shaft whip and permits the use of lighter shaft and bearings; 7—Spot welded assembly plus method of making blades and hubs permit economic manufacture with low cost.

△ 6—Densewood Mallets

Densewood Corporation, Elkhorn, Wisconsin, offers Densewood mallets or soft-face hammers for metal shops,



with handles locked in position by the "Lock Wedge" method. Densewood is non-porous and non-static.

New Products

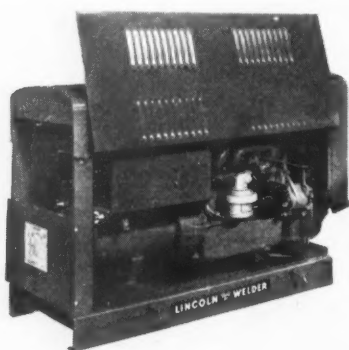
For your convenience in obtaining information regarding these items, use coupon on page 88.

7—Engine Driven Welder

The Lincoln Electric Company, Cleveland, announces a new engine driven arc welder designed for job welding and garage work, and which embodies a new system of engine-speed control for maximum fuel economy and minimum engine wear.

Of 200-ampere size, this new Lincoln unit is engineered for profitable welding applications of all types and sizes. Its compactness and light weight make it readily portable.

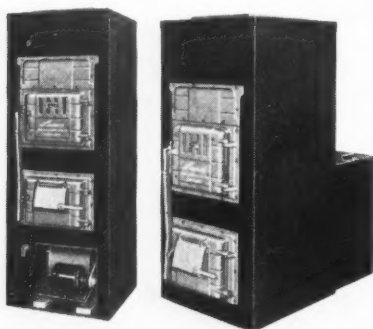
The machine's self-indicating volt-



age control ("job selector") and current control make it easy for the operator to select any type of arc and any arc intensity to suit the job.

8—Defense F. A. Furnaces

The C. A. Olsen Manufacturing Company of Elyria Ohio, manufacturers of the complete line of Luxaire warm air heating and air conditioning units, has gone all out for defense housing with two new forced-air furnaces which are smaller in size and

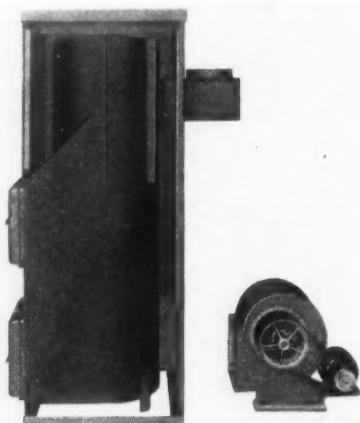


lower in cost, to meet the demands for low cost defense housing heating.

These two new compact forced-air, coal burning furnaces, requiring a small space for installation, can be had in a model where the blower compartment can be installed at either side or rear of furnace, or in the compact Hiboy model. Heating elements are of all steel welded construction, cabinets made of enameled steel with steel inner liners and rocking and dumping grates.

9—Dowagiac PBA

The Dowagiac Steel Furnace Company, Dowagiac, Michigan, is supplying their new PBA-18 coal fired conditioner for use in PBA, USHA and other defense applications. The



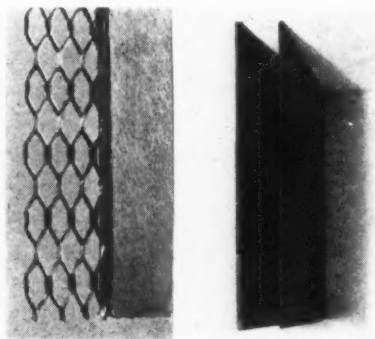
"Dowagiac" develops 60,000 Btu at the register.

It has a heavy steel drum and a blower. It is supplied complete with plenum and is efficiently designed with 20.4 ratio of heating surface to grate area. The blower and unit are cased in twenty-two gauge sheets, finished in gray baked enamel.

10—Asphalt Mastic Board

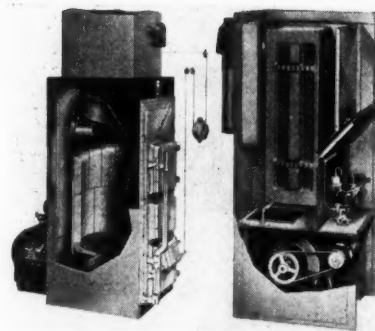
Keystone Asphalt Products Company, 43 East Ohio Street, Chicago, announces a new asphalt mastic board, designed for duct work in industrial air blower, air conditioning and warm-air heating systems.

The product, unlike asphaltic building boards, is not a fluxed oil sheet,



but is composed of a high melting point asphalt in combination with fine mineral aggregate, sealed between dry non-bleeding liners to provide a waterproof, rigid non-warping board, available in thicknesses from 1/8- to 1/2-in., widths up to 48 in., any length.

The company is also offering a reinforced sheet made with a center core of expanded metal laminated between sheets of asphalt mastic board.



11—Sunbeam Denfense Units

American Radiator & Standard Sanitary Corporation, P. O. Box 1226, Pittsburgh, Pa., has added two new winter air conditioners—the Allerton (5520-X) for coal, and the Wyandotte (SUV-55) for gas. Both are designed to meet heating requirements in low cost defense housing, with or without basements. New jackets are in Placid Blue.

The Allerton (5520-X) Coal-Fired Winter Air Conditioner, 26 in. wide, and 59 in. high, delivers from 51,800 to 64,700 Btu at register, depending upon the fuel. Among its features are heating element baffle and jacket liner to prevent heat loss up the flue or through jacket. Eight gauge steel heating element is welded and riveted at the seams. Duplex type grates make for easy operation. The blower is the quiet double inlet type with self-aligning bearing sockets. Blower cabinet and filter are optional.

The Wyandotte (SUV-55) Gas-Fired Winter Air Conditioner has great flexibility of installation. Return air can enter from left, right, or front. Slip joints on the jacket make assembly quick and easy. Standard controls include main shut off valve, gas pressure regulator, gas valve, automatic pilot, blower limit switch and plain thermostat. Two control combinations are available. Blower is the quiet double inlet type with self-aligning bearings. Filter with rack, optional. Btu capacity at register is 39,600. Width 22 in., height 60 1/2 in., depth 25 3/4 in.

12—Plastic Fan Blades

Torrington Mfg. Co., Torrington, Conn., announces the use of sheet plastic as a blade material for Aristocrat quiet propeller fan blades. It is light weight, non-resonant and non-corrosive. However, officials point out that this is merely a temporary expedient for the emergency. The material is not ideal, but will serve all general purposes.

It is stated that the new blades cannot be formed, but are given some curvature by the use of a specially formed spider. Performance is nearly identical to that of the steel and aluminum Aristocrat blades which are still being produced. Sizes available are limited to 10, 12, 14 and 16 in. standard 4-blade series at present.

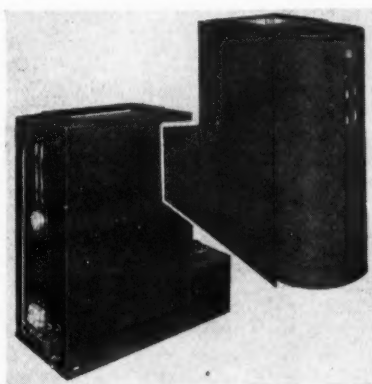
New Products

For your convenience in obtaining information regarding these items, use coupon on page 88.

13—Cottage Units

The H. C. Little Burner Co., San Rafael, Calif., announces a new line of furnaces known as "Cottage" units, to provide low-cost oil heat for defense homes.

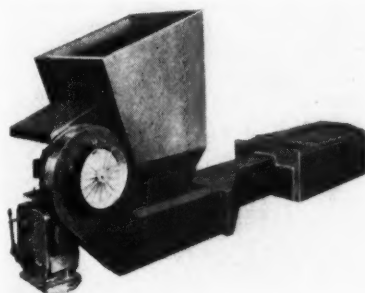
Capacities range from 50,000 to 95,000 Btu output at the bonnet. The patented vaporizing burner burns No. 3 fuel oil and all the units are listed



by the Underwriters' Laboratories. Automatic types (illustrated, right) operate by electric ignition and have no pilot light. Manual units (illustrated, left) are easily lit from the front and are controlled by a dial on the oil control valve.

14—Redesigned Stokers

Frederick Iron & Steel Company, E. 7th & East Sts., Frederick, Md., has redesigned its line of commercial and industrial underfeed screw type stokers. This line incorporates hopper and bin feed models, with clinker type burners or with side dumping grates. Sizes range from 200 to 850 lb. of coal per hour.



These stokers are equipped with large, heavy duty, three speed automotive type transmissions, oversized motors and fans. Totally enclosed windboxes and stoker fronts are provided to assure air tight air chambers and to eliminate much installation expense. Two doors in the stoker front provide for positive windbox cleanout.

Stokers have full active self-contained burning ends made up of segmental type tuyeres.

15—Draftender

Penn Electric Switch Co., Goshen, Indiana, has available an easy-to-install Draftender control for hand-fired heating jobs, designated as Type 910.

Penn Type 910 Draftender control incorporates brushless shaded coil

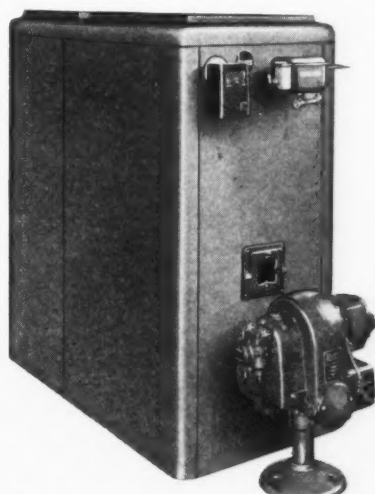


transformer type motor, armature shaft carried in self-aligning self-adjusting ball bearings, motor and gears permanently lubricated and housed in a die-cast case. Cut sprocket gear transmits power to dampers through a polished sprocket chain.

16—Rudico Air Conditioners

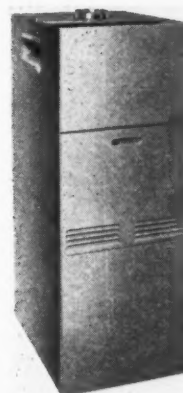
The Rudy Furnace Company, Dowagiac, Mich., announces completion of two more sizes to complete its line of steel oil heat air conditioners.

The new units bring to three the sizes available in this series using the



built-in heat traps known as Heat Equalizers (to lengthen fire travel and hold heat within the furnace to be delivered to rooms by the blower between burner operations). Output ratings are from 81,000 to 185,000 Btu per hour. The two smaller sizes are shipped as packaged units with most of the wiring and control equipment in place. Refractory combustion chamber and automatic humidifier are built-in at the factory.

The S80 RO series with 81,000 Btu output may be used in basements.



17—New Gas-Fired Janitrol

Surface Combustion, Toledo, Ohio, announce a new Janitrol gas-fired conditioner Series FCS, designed especially for the defense housing work.

The new unit incorporates the "Multi-Thermex" heat exchangers and the "Amplifire" burner used in other Janitrol products. This type of heat exchanger consists of a battery of heavy gauge steel tubes, vertically placed with horizontal fins projecting into the air stream, thus giving a maximum heat transfer area. Each tube is equipped with internal heat absorbers.

The "Amplifire" burner is constructed of gray iron into which are welded a series of corrugated strips forming the burner ports. This construction results in a clear flame that travels rapidly along the ports and with a long range of turn-down combined with quiet operation.

The blower fan is motor driven through endless type V-belts, shipped as a part of the completely assembled heating unit. All controls are enclosed inside the casing and are accessible from the front.

The FCS Unit is made in three capacities . . . 60,000, 75,000 and 90,000 Btu input. Outside dimensions of the casing of the 60,000 and 75,000 Btu sizes is 49 1/2" high, 18 3/4" wide and 26 in. deep.

△ 18—Roofing and Siding

Porcelok Company, a subsidiary of Davidson Enamel Company, Clyde, Ohio, is manufacturing porcelain enameled corrugated roofing and siding. The exclusive feature is the special "interlock" that permits complete protection for all bolt heads or other fasteners. The sheets lap in such a way that each covers the fastenings of the preceding sheet.

Porcelok sheets are available in lengths up to 12 feet. Full sheets are 25 1/4 in. wide and expose 24 in. to the weather. Half sheets, approximately 12 in. wide, are available for starting alternate courses.

All sheets are cut, beveled, punched and otherwise prefabricated to erection drawings before enameling.

Several standard colors are available, including camouflage effects.

Association ACTIVITIES

Detroit

At the annual meeting of the Detroit Association of Warm Air Heating and Air Conditioning Contractors, Inc., annual reports were read and the following officers were elected:

President—Thomas W. (Bob) Clark
Vice-Pres.—Dewey L. Cain
Secretary—Marshall Van Assche.
Treasurer—Raymond Zick
Directors: Ernest C. Simmons, Cliff Shorks,
Otto Schultz and James G. Van Assche

In retiring as president, Ernie Simmons voiced his sincere appreciation for the fine co-operation given him by the membership during his two terms. The meeting also voiced its approval of Ernie by a unanimous rising vote of thanks for his fine service to the association. Bob Clark gracefully accepted the office of president in a few well chosen words.

Salmo board is now approved by FHA for cold air returns along with plywood and the several hard boards previously reported. It must be kept six feet or more from the furnace, S cleat joints, to be nailed every two inches on all joists which it spans, and must have the written approval of the builder and owner. It may be stripped under the joists.

These are troubled times and many of us are in a quandary as to what we should do. We can not foresee the future except in a limited fashion but this much is sure—in the case of some critical materials, we shall have to depend almost exclusively on stocks now on hand and with all others the supply will be very limited. Our forefathers faced the unknown and a much harder lot with courage and faith. Can we do less?

Milwaukee

The January 5 meeting of the Milwaukee Sheet Metal Contractors' Association was entertained by a speaker representing the Edwards Motor Company with a movie entitled "Over Africa on Wheels." The movie was instructive and entertaining, demonstrating the hardships of the Dodge motor cars in crossing the African continent.

Past President Angelo Hoffmann presented the activities of a committee which drew and formulated the Milwaukee Plan of Priority Allocation to be presented to the OPM at Washington.

Angelo Hoffmann made a motion, seconded by F. Kramer, and unanimously approved, that the association co-operate with labor in their endeavors to bring about the appointment of a competent inspector to fill the City Hall vacancy.

Paul L. Biersach, Secretary.

Master—Chicago

The Master Furnace and Sheet Metal Association, Chicago, held their eleventh annual banquet on Saturday, February 7, at the Southmoor Hotel's Venetian Room, 67th & Stony Island Avenue.

Roy Mahlberg was master of ceremonies. Floyd Townsend, president, gave the address of welcome. Miss Jean Mahlberg, daughter of the master of ceremonies, took part in the entertainment. Other entertainment included radio songstress Reda Marqué, and Axel Christensen as guest speaker and musical offerings. Music for dancing was furnished by Eddie Warner and his orchestra, featuring Reda Marqué.

The banquet committee consisted of Harry H. Kay, Elmer Brodeen, Paul Barth and Floyd Townsend.

Ohio

M. A. Thesmacher, Chairman of the Ohio State Convention Committee has announced complete plans for the 28th annual convention of the Ohio State Sheet Metal Contractors Association. The convention will be held at the Hotel Carter, Cleveland, February 24, 25 and 26.

The entire thought of the committee has been to produce a program which will give some answers to the most pressing problems, and with that idea in mind, has lined up able speakers on the heating and air conditioning outlook for 1942, and the shape of things to come in metal.

Representatives of the Quartermaster General's Army Procurement Division, the War Production Board, the Industrial Commission of the State of Ohio, as well as a representative of the Selective Service Board will make addresses on the subjects assigned, and will answer questions from the floor of the convention.

Entertainment is planned for the delegates, their ladies and guests on the night of the 24th, and the annual banquet and dance will be held on the night of the 25th. A special ladies program is being formulated by Mrs. D. A. Mannen and her Ladies' Committee, which will include a get together tea on the 24th, and a style show, luncheon and bridge on the 25th.

Chicago Institute

At the January 23rd meeting of the Furnace-Air Conditioning, Sheet Metal Institute, Rudy Guenther of the Accurate Manufacturing Works, Chicago talked on better furnace installations, using a blackboard to illustrate his talk. Mr. Guenther confined his talk particularly to the cold air side of the furnace often found short in old houses. He stressed correct design and installation according to findings at the University of Illinois.

Mr. Guenther distributed copies of their "Accurate Area and Circumference Table" used in estimating, and offered copies to anyone interested. Questions were asked and answered.

1942

CONVENTIONS

- Feb. 24-26—Ohio Sheet Metal Contractors Association. Hotel Carter, Cleveland. Carl M. Gundlach, Secretary, 910 Columbus Ave., Sandusky.
- Mar. 3-5—Michigan Sheet Metal, Roofing, Heating and Air Conditioning Contractors' Association. Annual Convention. Fort Shelby Hotel, Detroit. J. L. Sherk, President, 6318 Fourteenth St., Detroit.
- Mar. 17-19—New York State Sheet Metal, Roofing & Air Conditioning Contractors' Assn., Inc., Annual Convention. Utica, N. Y. Clarence J. Meyer, State Secretary, 567 Genesee St., Buffalo.
- Mar. 23-26—11th Annual Forced Warm Air Conference at Michigan State College, East Lansing. Professor Lorin G. Miller, Mechanical Eng. Dept., Michigan State College.
- April 8-9—Illinois Sheet Metal Contractors Association. Hotel Jefferson, Peoria. Wm. W. Johns, Secretary, 212 W. Main St., Urbana.
- Apr. 14-16—Heating and Air Conditioning Conference. Seventh Annual, Iowa State College, Ames, Iowa.
- Apr. 17-18—The Roofing and Sheet Metal Contractors Association of Florida. Annual. Miami. L. A. Burgess, Secretary-Treasurer.

Salvaging Steel Dust

★ ★ *for* ★ ★
Needed Scrap Supply



BETH-CU-LOY GALVANIZED STEEL SHEETS

Here's a good example of a type of work by a sheet-metal contractor which will mean much to America's war effort: a dust-collecting system to service a battery of steel-billet grinders. The entire unit is shown as pre-assembled in the contractor's shop, before being knocked down for delivery to point of installation.

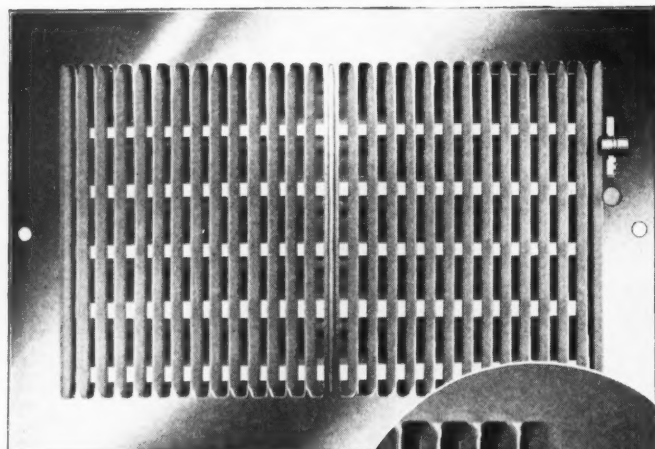
In action, the system will handle a highly abrasive mixture of fine steel dust and sharp carbide particles resulting from grinding of steel billets. The unit will not only "clear the

air" for the operators, making for better, faster work, but also salvage both the steel and the carbide for future use.

When you figure on such industrial work, where corrosion and abrasion are both heavy factors, remember to specify Beth-Cu-Loy as this contractor did. Doubly guarded by a tight coat of zinc plus 0.20 to 0.30 per cent copper in the steel itself, Beth-Cu-Loy Sheets will stand up longer in the most severe conditions, yet the added cost is negligible—only a few cents more per sheet.



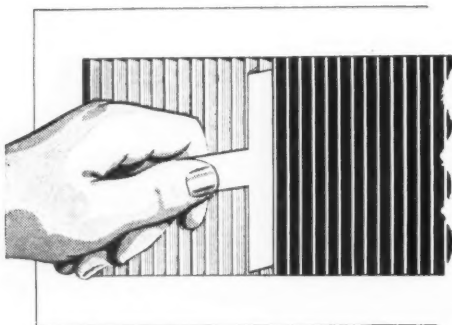
BETHLEHEM STEEL COMPANY



**SCIENTIFIC
AIR
DISTRIBUTION
plus
PRICE . . .**

THE PLIAVANE

Here is the outstanding value in Air Conditioning registers. Individually adjustable Face Vanes easily and quickly provide sidewise deflection, while a series of shutters, adjustable from the face, provide up and down deflection *at the same time*. Also made in the conventional single-valve construction, adjustable for up and down deflection only.



Send today for Catalog No. 41, a complete guide to Air Conditioning, Heating and Ventilating Grilles, Registers and Air Controls.



TUTTLE & BAILEY, Inc.

NEW BRITAIN, CONN.

NEW YORK

CHICAGO

PHILADELPHIA

HOUSTON

Association Activities . . .

(Continued from page 82)

Michigan

The 31st annual state convention of the Michigan Sheet Metal, Roofing, Heating and Air Conditioning Contractors' Association is to be held at the Hotel Fort Shelby in Detroit on March 3, 4 and 5. The convention committee is of the opinion that one of the finest programs ever presented to our industry has been arranged.

On Tuesday, March 3rd, will be the meetings of the heating directors and of the association directors.

Following registration on Wednesday, March 4th, there will be an address of welcome by the Hon. Mayor Jeffries; an address by Harvey Campbell of the Detroit Board of Commerce; an address by Prof. S. Konzo of the University of Illinois, sponsored by the National Warm Air Heating and Air Conditioning Contractors' Association; an address and motion pictures on the manufacturing of roofing by James Dunham; a meeting of Built-up Roofers and Outside Sheet Metal, of which P. O. Wierenga is chairman, and a banquet and entertainmet at 6:30 p. m. by the Detroit Association.

On Thursday, March 5th, there will be a meeting of the Heating Division—John Sweet, Chairman—with discussion of emblem and agreement; separate meetings of the entire state association, and the salesman's auxiliary at 11 a. m.; at 2 p. m. James E. Wilson, manager of the Michigan office War Production Board and Priorities field service, will discuss priorities, assisted by T. I. Easton; at 3 p. m.—Plastics—an address and demonstration by Wm. Goggin of the Dow Chemical Company, Midland, Mich.; and at 6:30 p. m., banquet and entertainment by Auxiliary.

"Sheets" is the association publication of The Michigan Sheet Metal, Roofing, Heating and Air Conditioning Contractors Association. No. 1 of Vol. II states that "Any one desiring may have their name on the mailing list free of charge, provided they are connected with this industry in the State of Michigan."

The bulletin reports activities of the association and members are invited to write in letters of commendation or criticism.

Legislation and taxes of interest to the association are reported, as well as mention of the various local association meetings throughout the state.

Members were urged to specify on all orders "National Standard Toncan Iron" formerly Michigan Standard. This brings some income to the association.

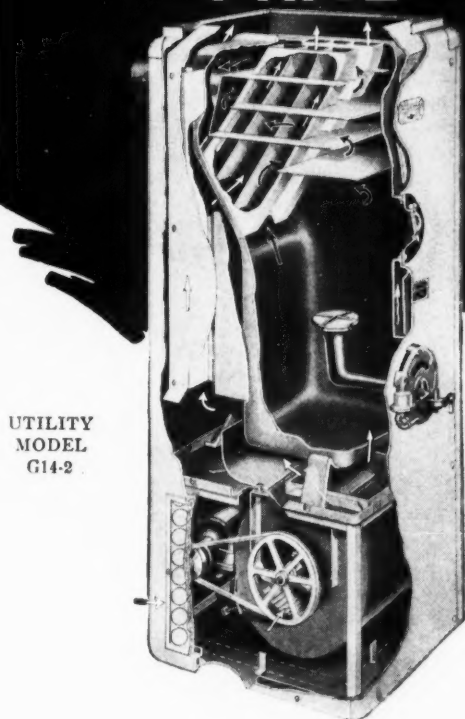
An insignia of suitable design for the heating section was proposed by Vice President Elmer Schartow of Midland, well over a year ago when then a member of the Board of the Air Conditioning Section. Mr. Schartow proposed that we adopt an insignia of suitable design to be used on stationery, shop and office windows, trucks, and on the jobs with a suitable tag. This insignia would identify the contractor as a member of the association and could only be secured by agreeing to certain conditions. The insignia has not been designed, but the necessary contracts have been drawn and need only the necessary legal study to be ready for adoption by the association. It is believed that the adoption of such an insignia would put a stop to some of the terrible work put out under the name of gravity warm air heating and air conditioning. The tentative contract as now drawn says that upon demand, any proven violator must immediately cease the use of the insignia on his stationery, all advertising matter or signs or else be subject to damages.

Priorities were discussed, as well as the orders of the various boards covering inventories, repair, maintenance, etc.

N. J. Biddle, Fort Shelby Hotel, Detroit, is editor.

J. L. Sherk, President

The MOR-MAC UTILITY MODEL *offers* AVAILABILITY EFFICIENCY PRICE



UTILITY
MODEL
G14-2

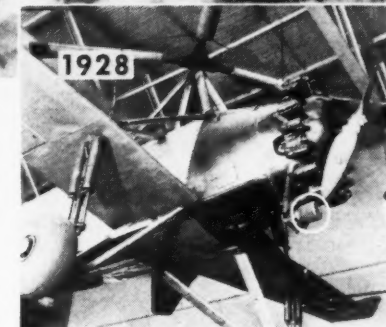
Here is your answer to the problem of maintaining your volume during the emergency. The Mor-Mac Utility Model is available under priority rulings in all defense areas, and a defense housing contract assures you of prompt delivery.

The Mor-Mac 14-2 is designed for the small home and fits perfectly into defense housing plans. It may be installed either in a utility room or the basement. It is a sturdy, efficient, winter air conditioner built for dependable service. It utilizes the same tubular principle of heat transfer as larger Mor-Mac units, and develops maximum heating efficiency with minimum fuel consumption.

The Utility Model is a packaged unit and is shipped fully assembled in a rigid container. It can be put in operation immediately by simply setting the burner and wiring the controls. Both oil and gas fired models are available. Features include all welded, heavy copper-bearing steel firebox; scientific air distribution; pre-assembled, attractively finished, die-stamped casing; over-size blower. Casing width 22"; casing length 25"; casing height 58 $\frac{3}{4}$ ". Capacities: Oil 67,000 b.t.u., Gas 64,000 b.t.u.

Write or wire for prices, specifications and delivery.

MORRISON STEEL PRODUCTS, INC.
601 Amherst Street Buffalo, New York



Modern 1942 Ryan Trainer above is equipped with AIR-MAZE Air Filter Panel.

Lower photograph shows Autogyro of 1928 equipped with cylindrical AIR-MAZE Air Filter—now in Smithsonian Institute.

for more than 15 years AIR-MAZE Air Filters have given Vital Protection to Airplane Engines

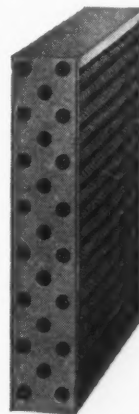
Since 1926 AIR-MAZE Air Filters have added many hours of life to airplane engines by protecting them against ruinous dust and grit. Without such protection aircraft engines are subjected to damaging and power-diminishing wear! Today most modern fighter planes... including interceptors, pursuit ships and bombers... as well as trainers, are AIR-MAZE protected.

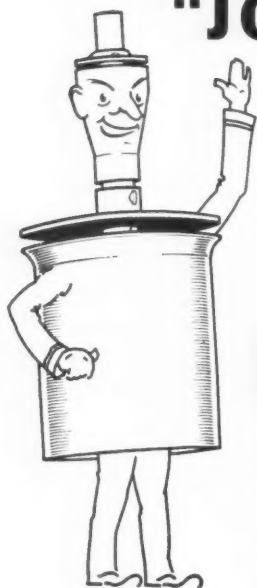
Differing somewhat in construction but identical in principle, AIR-MAZE Air Filters offer the same high standard of efficiency and protection for industrial and residential air conditioning applications as they deliver in airplane service.

Permanent, sturdy, washable, and fire resistant, they insure top notch performance from your air conditioning system and utmost protection to your equipment. They need no replacements—hence their first cost is the last. They save fuel and power... setting a new high in air filter economy.

Considering these advantages, it is not surprising that AIR-MAZE has attained such a commanding position in the air filter industry. Write us regarding your air filter problems.

AIR-MAZE CORPORATION
5130 Harvard Avenue Cleveland, Ohio

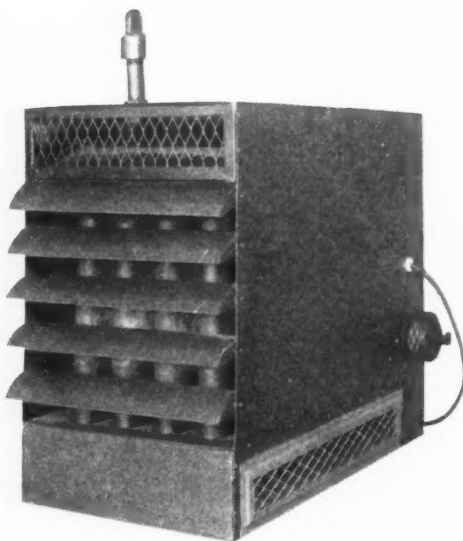




"JOHN ZINK now makes a UNIT HEATER"

You would expect it to be good—designed and manufactured by combustion engineers who for twelve years have enjoyed a world wide reputation as experts who know how to burn gas efficiently.

Approved by A. G. A.



These new unit heaters are equipped with a long life, cast iron burner of John Zink's own design and manufacture. 100,000 B.t.u./h.r. They are particularly adapted to heating and ventilating large or small spaces in industrial and commercial buildings. Forced circulation provided by a heavy duty electric motor and quiet running fan. Equipped complete with built-in controls including Thermostat.

Write for Information

John Zink Company

TULSA, OKLA.—4401 S. PEORIA AVE.

Chicago, Ill.—7309 E. End

New York City—342 Madison Ave.

Houston, Texas—6515 Harrisburg Blvd.

New Literature . . .

For your convenience in obtaining copies of new Literature use the coupon on page 88.

201—Tubular Winter Air Conditioners

Morrison Steel Products, Inc., Buffalo, N. Y., is distributing a folder picturing and describing Mor-Mac tubular winter air conditioners, with specifications for their oil and gas models. The home factory is also pictured and described.

202—Asbestos Return Air Sheets

Grant Wilson, Inc., 4101 W. Taylor St., Chicago, is distributing a 16-page booklet covering the new improved A. R. A. (Asbestos Return Air) Sheets, developed and perfected for sealing joist spaces into return air ducts, unhampered by the shortage of steel.

203—Air Moving Equipment

Utility Fan Corporation, 4851 S. Alameda St., Los Angeles, is distributing a 6-page folder on their air moving equipment—blowers, industrial exhausters, propeller fans, spot coolers, all-year conditioners and enclosed drive blower sets.

204—The Modern Arc Welding Technique

The Lincoln Electric Company, 12818 Coit Road, Cleveland, is distributing a 20-page booklet describing the Lincoln "Shield-Arc" welder with self-indicating dual continuous control of voltage and current.

The self-indicating dual continuous control permits the right type and size of arc to suit every job.

205—Fractional Horsepower Motors—F-8623

Westinghouse Electric and Manufacturing Company, Department 7-N-20, East Pittsburgh, Pa., announces a new 8-page folder describing small motors from 1/6 to 1/2 horsepower, 145 frame size for general use.—Folder F-8623.

The standard parts making available more than 5,000 combinations of type, rating, and mounting, are described and illustrated. Charts show motor characteristics plotting per cent synchronous speed against per cent full load torque.

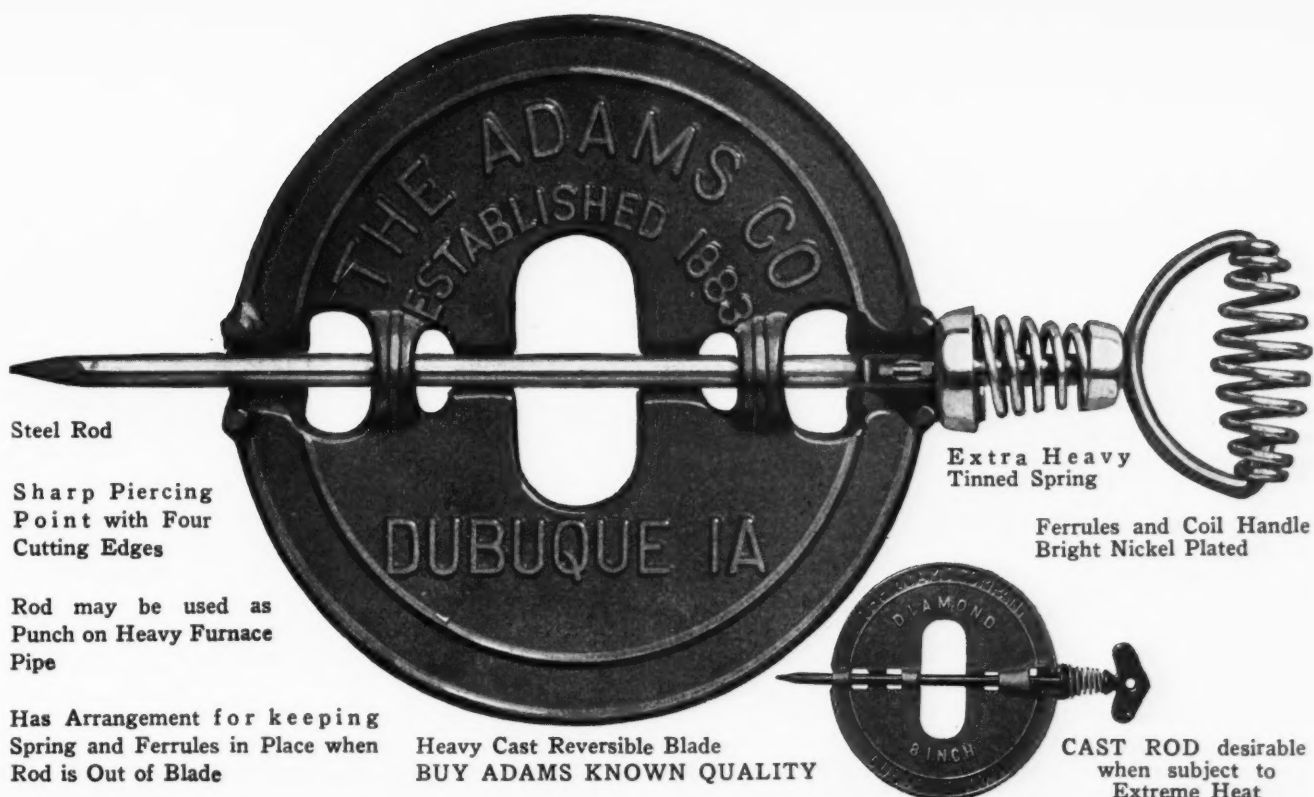
Features conducive to long motor life and low maintenance are discussed. Thermoguard protection against overloads and excessive temperature is explained. Black-line drawings give the necessary physical and mounting dimensions.

206—Penn Announces New Campaign

Penn Electric Switch Co. of Goshen, Indiana, announces a new campaign designed to help heating distributors, dealers and servicemen get more maintenance and modernization business which is currently being encouraged by Defense authorities. This campaign has a dual benefit: It enables cooperation with the vitally important "Save Fuel for Defense" movement and presents an opportunity to make a legitimate extra profit.

Built around the Day-Nite Control, the campaign reminds distributors, dealers and servicemen that automatic night lowering of temperature with Penn Day-Night Control is one important way to save fuel. 4 out of 5 other-wise modern heating installations do not have such control. Yet, surveys indicate that every user of automatic heating needs and wants Day-Nite Control.

To make it easy for dealers to dig up worthwhile prospects, Penn has prepared a folder which is packed full of "down-to-earth" selling facts. The folder explains how the Day-Nite Control operates, how simple and economical it is to install, how it increases heating comfort and how big savings in fuel bills can be made. These folders for use as mail enclosures and hand-out pieces to customers are available free to distributors, dealers and servicemen.



DIAMOND SMOKE PIPE DAMPER
 Manufactured by **THE ADAMS COMPANY** Dubuque, Iowa, U.S.A.
ESTABLISHED 1883

Tell Your Industrial Accounts **MEN CAN'T WORK OVERTIME** **IF AIR WORKS**

Emergency conditions create a tremendous market for Utility Air Moving Equipment in industrial plants. Long working hours and seven-day weeks make proper ventilation more necessary than ever. Only with good working conditions can production be continually increased.

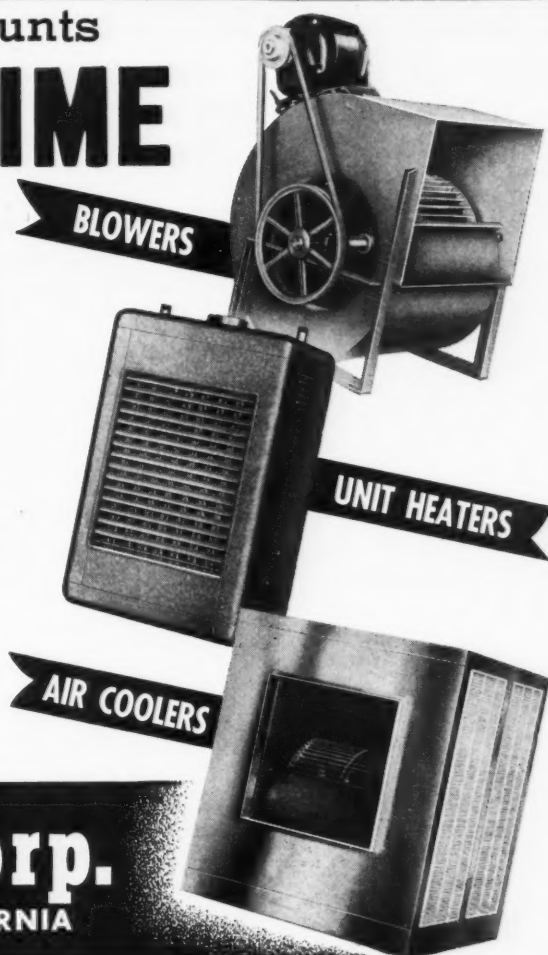
You can build up your own business—help to speed defense production—by selling and installing modern, proven Utility equipment for ventilating, cooling and heating.

Write for folder on Air Moving Equipment or Complete Catalogs

Depend on

UTILITY FAN Corp.

4851 S. ALAMEDA • LOS ANGELES, CALIFORNIA



New Literature

For your convenience in obtaining copies of new Literature use the coupon on page 91.

207—Excelsior's 61st Anniversary Literature

The Excelsior Steel Furnace Co., 115 S. Clinton St., Chicago, has reproduced the first catalog issued by the firm sixty-one years ago, together with a little story with reference to steel furnaces in general.

208—Steel Aerofuse

Tuttle & Bailey, Inc., New Britain, Conn., is distributing a 20-page booklet covering the Aerofuse outlet for air conditioning, heating and ventilating. The various types of outlet are described, followed by dimension schedules, installation methods and selection system tables.

209—Dealer Discount Sheets

Accurate Manufacturing Works, 2336 Milwaukee Ave., Chicago, is distributing catalog sheets covering their revolving ventilators, chimney tops, and bases. Shipping weights, sizes, prices and discounts are included. Large ventilators—18 inches and larger—have louvers as regular equipment.

210—Brown 1942 Calendar No. G-45

The Brown Instrument Company, Wayne & Robert Aves., Philadelphia, offers their 1942 calendar portraying the varied problems encountered in modern industrial processes by a series of original cartoons by Bill Eddy. The drawings have been reproduced in four colors to keep them as similar to the originals as possible. Photographs and descriptions of the various industrial instruments and control devices are shown along with the cartoons.

211—Registers, Grilles & Accessories

Hart & Cooley Manufacturing Co., Holland, Mich., is distributing Catalog No. 42 covering their entire line of gravity registers, air conditioning registers, and accessories. A great many lines have been dropped in the interest of simplification.

The air conditioning technical data section has been much simplified. The graphic sizing charts on pages 35-38 are convenient.

One new air conditioning register—No. 88 on pages 55-57—is a double deflection register of shallow depth (1½ in. from wall to extreme edge).

Display panels are shown on page 75, and are available at small cost beyond the cost of the registers only. These panels are small enough to be carried to the prospect's home.

Reprint sheets are available, free of charge.

FOR YOUR CONVENIENCE

American Artisan, 6 N. Michigan Ave.
Chicago, Ill.

Please ask the manufacturer to send me more information about the equipment mentioned under the following reference numbers in "New Products" and "New Literature."

(Circle numbers in which you are interested):

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18			
201	202	203	204	205	206	207
208	209	210	211			

Name

Company

Address

Are you Manufacturer—Jobber—Dealer—

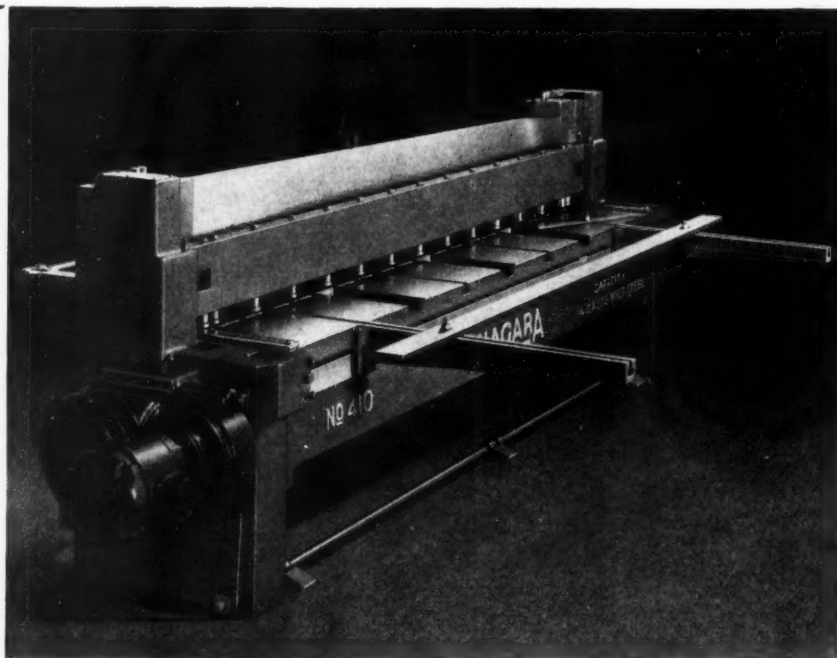
The New NIAGARA

SERIES No. 4 POWER SQUARING SHEARS

Accuracy, heretofore unattainable is offered by this new series of Niagara Power Squaring Shears. They cut sheared edges that are straight to within a very few thousandths of an inch. Narrow strips, accurate to gage setting and parallel within close limits are produced.

High production of 75 strokes per minute is made possible because of their fast operating speed, instant engagement of the Niagara Sleeve Clutch, quick release of holddown, and convenient operation. Motor is direct connected.

The drive, including flywheel, gearing, clutch and eccentrics, is enclosed and operates in a bath of oil. A new detent device re-



Capacities: 12 to 16 gage; 4 to 12 foot lengths

quiring no adjustment or attention replaces the customary friction brake.

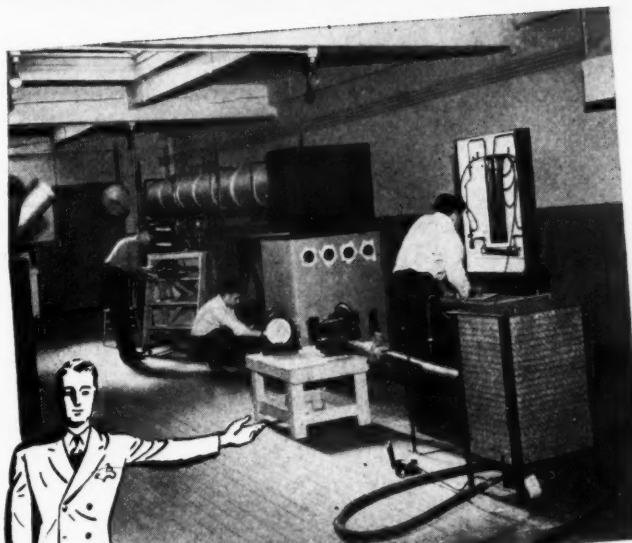
Standard equipment includes ball bearing, self-measuring, parallel back gage, front and side gages, and four-edge, solid tool steel knives.

NIAGARA MACHINE & TOOL WORKS, Buffalo, N.Y.

Branches: Leader Building, Cleveland; General Motors Building, Detroit; 50 Church St., New York



WHY I'M GLAD
I SELL PAYNEHEAT

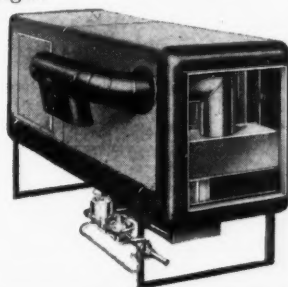


PAYNE ENGINEERS ARE SPECIALISTS IN *Gas* HEAT

IF YOU BELIEVE "Practice Makes Perfect," you'll understand why PAYNEHEAT is nationally famous for efficiency—reliability—fuel economy—long life. ☆ For more than a quarter-century PAYNE engineers have always concentrated on one objective: *Better Gas Heating*. Result: PAYNE today is the Nation's largest exclusive manufacturer of gas heating equipment. ☆ Sixty-nine sizes and styles of units offer the Dealer or Gas Company an answer to any heating problem. ☆ Build for the future with PAYNE'S versatile 69!

In the Emergency, our order of delivery is necessarily as follows: (1) U.S. Defense needs; (2) Established Payne Dealer's orders; (3) New business. For further information we cordially invite you to write J. H. Keber, Sales Manager.

PAYNE Spacesaver Unit. One of the versatile 69 models and sizes produced by PAYNE. All are double-tested: AGA plus PAYNE Testing Laboratory.



PAYNEHEAT

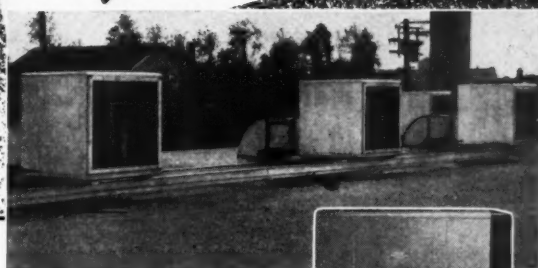
MORE THAN A QUARTER-CENTURY OF



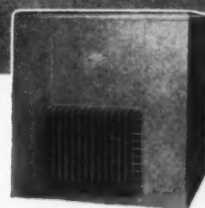
SPECIALIZATION

Payne Furnace & Supply Co., Inc., Beverly Hills, California

EVAPORATIVE COOLING *Your Best Bet*



(Above) Typical Kooler-aire installation at Marzano Bowling Alleys in Chicago.
(Right) Front view of Kooler-aire Unit.



Kooler-aire EVAPORATIVE COOLING Helps You Carry On

IF YOU are wondering how to "carry on" under today's difficult conditions, you will find encouragement and opportunity in usAIRco's story—"Today's Job In Evaporative Cooling".

It shows you how you can carry on in the interest of public health and safety with Kooler-aire Evaporative Cooling and Ventilating Units—emphasizes the vital role of air conditioning in the national war effort—how it safeguards health, steps up efficiency, speeds output.

Kooler-aire Evaporative Cooling Units require practically none of the critical materials necessary in refrigeration cooling (which we also manufacture) and take much less productive time to build. They fit into the national economy because they cost much less to buy, install, maintain and operate.

In every kind of store, in restaurants, beauty parlors, bowling alleys, banks—in every place of business—wherever people work or congregate—there's a need for Kooler-aire. We are ready to help you supply this need like we have been helping hundreds of other usAIRco dealers the past 18 years.

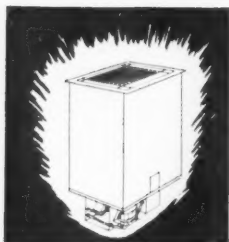
Write usAIRco Today . .
Ask for "Today's Job"



UNITED STATES AIR CONDITIONING CORPORATION

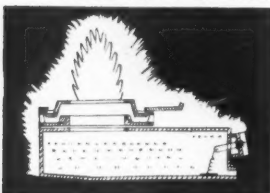
NORTHWESTERN TERMINAL • MINNEAPOLIS, MINN

How to Solve the Small-Home Heating Problem



OIL-BURNING FLOOR FURNACE GIVES LOW-COST HEAT!

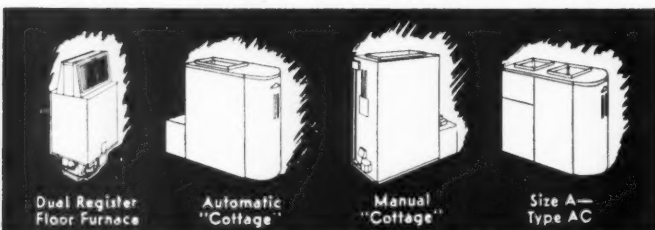
Here's a very compact and practical oil-burning furnace, completely assembled at the factory, ready to install right in the floor. Saves time, metal and space. NO warm air pipes, NO cold air returns, NO basement needed. Factory guaranteed. Offers years of trouble-free service. Burns cheap No. 3 furnace oil. NO soot, NO smoke, NO noise. Listed by the Underwriters' Laboratories. Only unit of its kind with Manual Control or Automatic Operation, Electric Ignition and Thermostatic Control.



AMAZINGLY SIMPLE BURNER HAS NO MOVING PARTS

All our units have the trouble-free H. C. Little Burner, the only vaporizing burner with fully automatic operation and electric ignition . . . the ideal burner for small-home use. It's Safe, Silent, Clean and Economical. Operates on patented principle of Progressive Low Temperature Carburetion. Has no pilot light to smoke or go out . . . no moving parts . . . igniter guaranteed for two years. Burns cheap No. 3 furnace oil and is Listed by the Underwriters' Laboratories.

OTHER H. C. LITTLE UNITS for SMALL HOMES



RECENT H. C. LITTLE INSTALLATIONS

Wills Project, Dundalk, Md. 112 Units
U. S. Govt., Indian Head, Md. 65 Units
Siems Drake Puget Sound Co. 109 Units
U. S. Navy Cont. 20 Units
Fairchild Addition, Seattle 22 Units
U. S. Engineers, Seattle, Wn. 10 Units
Towers Bldg. Co.,
Sparrows Pt., Md. 52 Units
Kelly & Sadler, Dundalk, Md. 102 Units

H. C. LITTLE Burner Co.

San Rafael, Calif.
Warehouse Stocks and Direct Factory Representatives in Boston, Newark, Baltimore, St. Petersburg, Aurora, Ill., Seattle and Portland, Oregon.

Please send me FREE BOOK-LET, "Six Low-Cost Oil Furnaces for Defense Homes".

Name

Address

City State

With The Manufacturers . . .

Osborn Elects Directors and Officers

At the annual meeting of The J. M. & L. A. Osborn Co., held in Cleveland on Thursday, January 22nd, the following directors were elected: A. W. Howe, J. W. Harrison, J. T. Hagan, C. T. Howe, C. E. Caddy, W. B. Osborn and G. F. Climo.

Elected to serve as officers for the ensuing year were: A. W. Howe, president and general manager; C. E. Caddy, vice president; J. W. Harrison, secretary, and G. F. Climo, treasurer.



Bird's-eye view of the new plant of the Ideal Furnace Company at Milan, Michigan, with a capacity of about 12,000 furnaces, 4,000 low pressure steam and hot water boilers, as well as about 3,000 to 4,000 tank heaters a year.

Lockformer Distributes Appton Air Hammer

The Lockformer Company, 4615 Arthington St., Chicago, has assumed international distribution of the Appton Super Air Hammer, designed especially for the sheet metal shop and for turning down the "hammer-over-edge" of Pittsburgh locks.

The Appton Super Air Hammer measures only 9½ inches overall and weighs only 5 pounds. It is easily held and operated in one hand. A knurled ring regulates the force of the blow from a gentle "nudge" for the lighter gauges to a smashing impact for heavy iron.

Discusses 1942 Program

At the annual sales meeting of Northern Steel and Stoker Corporation held at the Hotel Jefferson in Peoria,

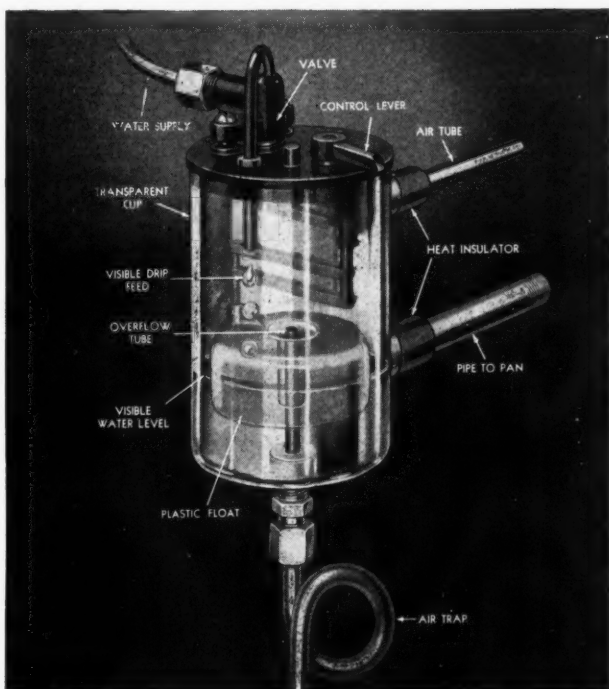


Seated (left to right) are Walter Bruflat, corporation accountant; T. W. Pallister, treasurer; H. J. Tyrrell, corporation president; A. J. Folkerts, sales manager, and Bill Brown, Minneapolis representative. Standing (same order) are Russ Wilson, Denver; H. S. Sisney, Peoria; John Hieb, Des Moines; Fred Roth, Chicago; George Mueller, St. Louis; Wheelless Gambill, Nashville, and O. E. Chytraus, Salt Lake City.

Ill., January 6, 7, 8 and 9, plans for tying the sales and advertising program for Stokerator's 1942 effort to the war economy of the nation were formulated.

Blackout Ventilation Problems

Utility Fan Corporation of Los Angeles has established a cooperative service to assist in prompt handling of ventilation problems in factories and industrial plants, resulting from night operations under blackouts. Manufacturers seeking prompt assistance are guided by the experience of Utility engineers and dealers, so that installations could be made in minimum time.



MONMOUTH FLOTROL

the world's finest float control

The Flotrol has EVERY feature required for a perfectly functioning float control. Other controls claim this or that SINGLE advantage, but Monmouth's acknowledged leadership in humidification engineering provides the Flotrol with ALL these exclusive advantages:

VISIBLE WATER LEVEL—A glance at the transparent Flotrol shows height of water in pan. Unnecessary to remove a hot cover and peer around inside.

VISIBLE DRIP FEED—It's easy to see the Flotrol working and know how fast the water is evaporating. But with other controls you can't tell without opening the furnace.

EXTERNAL WATER LEVEL CONTROL—A mere touch of the finger changes water level and evaporating rate. No guesswork or fussing around inside.

SEALED IN MECHANISM—Because it is absolutely trouble-free, corrosion-proof and lime-proof, the Flotrol is the only control that can be permanently sealed to prevent tampering.

SELF-FLUSHING DIAFRAM VALVE—This enclosed, frictionless, non-leaking and non-liming valve is an exclusive Flotrol feature.

All these advantages and many others make the Flotrol the peer of all float controls. Moderate price due to modern volume production. Get the complete story. Write now to:

MONMOUTH PRODUCTS COMPANY

1933 East 61st Street

Cleveland, Ohio

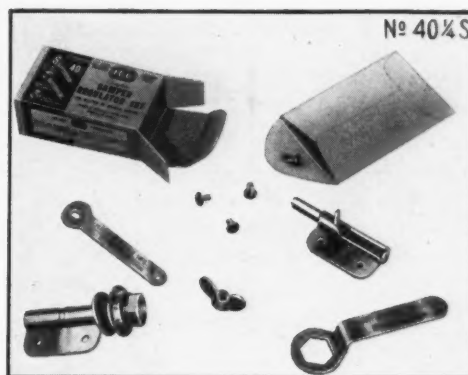
MONMOUTH

The Greatest Name in Humidification

H&C DAMPER REGULATOR SETS

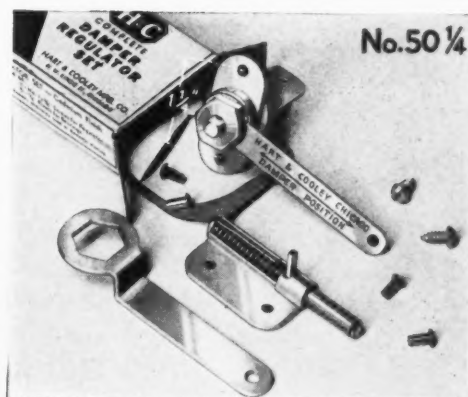
*Pick the Type
that Suits You Best!*

H&C offers three different sets in the 1/4" size, all furnished with snap end bearing to permit the installation of even the smallest dampers without bending. All are quality sets in every detail with all parts rust-proofed; all are equally adaptable to splitter or regular dampers. See your Jobber or write for sample and descriptive literature. 3/8" sets are available in class 503/8 and 803/8. Immediate shipment from stock.



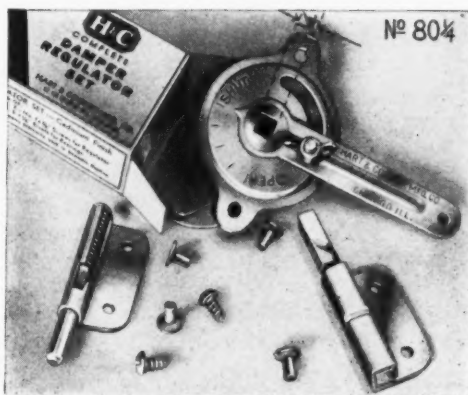
ECONOMY TYPE

Quality at a Price! Furnished with both wing and hexagonal lock nuts. Made only with 1/4" Bearings. No. 40 1/4 S — List Price 30c Set.



BRACKET TYPE

With 1/4" Bearings, No. 50 1/4 — List Price 40c Set. With 3/8" Bearings, No. 50 3/8 — List Price 60c Set. 1/4" size has snap end bearing.



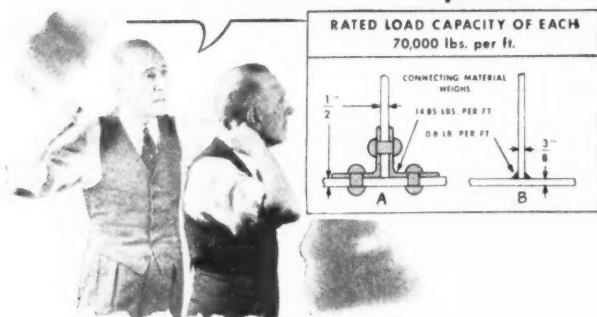
DISK TYPE

With 1/4" Bearings, No. 80 1/4 — List Price 40c Set. With 3/8" Bearings, No. 80 3/8 — List Price 60c Set. 1/4" size has snap end bearing.

HART & COOLEY MANUFACTURING CO.

Holland, Michigan — Chicago Office at 61 W. Kinzie Street

then I said to myself—



This looks like ... MORE FOR LESS

We've been more or less successful in our methods—but let's assume we're wrong. Let's get a fresh start and prove each step as right before we take it.

ALTER EGO: Fine exercise to prevent manufacturing ruts. Let's start with the two ways of joining two plates at right angle, say. What's the procedure for method "A"?

It's plain to see we hold the plates with angles and rivets. We must drill or punch holes, fit them up, fill them up with rivets and hammer down the heads of the rivets. This requires 14.85 pounds of connecting material per foot of joint.

ALTER EGO: And in method "B" you just weld a bead along each side of the joint. This joint requires only 8/10 of a pound of connecting material per foot. But look closer, what else do you find?

Here's the big point. To get a load capacity of 70,000 pounds per foot, in the case of "A" we must use 1/2-inch plate—while in "B" we can use only 3/8-inch plate!

ALTER EGO: Isn't it obvious then that welding gives MORE for LESS. Now, how can we get that for our present work and future plans?

A good starter would be to invest \$1.50 in that Procedure Handbook which is published by The Lincoln Electric Company, Cleveland, Ohio, and study it so that we can figure out how arc welding can give us MORE for LESS.

ALTER EGO: Literally, "one's other self"—the still, small voice that questions, inspires and corrects our conscious action.

Philadelphia's Heating Ordinance

(Continued from page 78)

expiration of any license, otherwise re-examination will be required.

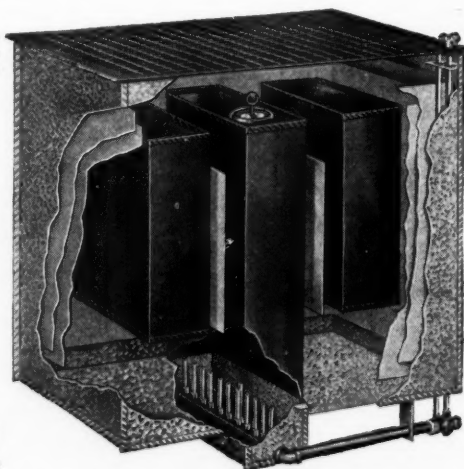
Section 8. It shall be unlawful to connect up any warm-air heating apparatus with any flues, outlets or otherwise that are not properly protected and found to be unsafe either by the registrant or the Fire Marshal; no unprotected metal flues shall be allowed to pass through partitions unless in accordance with the rules and regulations as provided by the Chief of the Bureau of Building Inspection.

Section 9. Any person so engaged in the business as aforesaid, who shall install or repair any warm-air heating apparatus without a certificate of registration being issued to him or after the revocation or during the suspension thereof or any person who shall receive such certificate of registration and shall violate any of the provisions hereof shall be subject to the penalty of not exceeding one hundred (100) dollars and upon failure to pay the sum within ten days to imprisonment not exceeding thirty days, to be imposed in accordance with the provisions of the Acts of Assembly of March 25, 1929, P. L. 66. Any conviction under this ordinance shall imme-

GIVE
YOUR
CUSTOMERS
PROVEN
QUALITY

! Install

COLE'S FLOOR GAS FIRED FURNACES



Here is the floor furnace that burns natural, artificial or mixed Propane or Butane gases with greatest economy and efficiency . . . Cole's Gas Fired Floor Furnaces are equipped with the patented burner whose automatic air intake requires no air adjustments.

The inner heating unit of the Cole Floor Furnace is of full vitreous porcelain enamel. Three walled galvanized steel casing.

Large heating surface and long delayed flue travel get maximum efficiency from fuel. Unit crimped and sealed by special Cole process insuring gas-tight and stay-tight construction.

Combination safety pilot and automatic thermostatic heat control available for all Cole Floor Furnaces.

Write for full details today.

COLE HOT BLAST MFG. CO.

3108 West 51st St.

Chicago, Ill.

diately rescind any license or certificate heretofore issued.

Section 10. If any sentence, clause or section or part of this ordinance is for any reason found to be unconstitutional, illegal or invalid, such unconstitutionality, illegality or invalidity shall not affect or impair any of the remaining provisions, sentences, clauses or sections or parts of this ordinance. It is hereby declared as the intent of the Council that this ordinance would have been adopted had such unconstitutional, illegal or invalid sentence, clause, section or part thereof not been included herein.

Section 11. All ordinances or parts of ordinances supplied hereby be and the same are repealed.

Attest: **WILLIAM W. FELTON,**
Clerk of City Council.

N. W. A. H. & A. C. Ass'n 28th Annual Convention

(Continued from page 74)

troubles with inadequate firing due to soldiers' complete ignorance of how to fire a furnace, might readily be overcome by the appointment of a civilian officer in charge of heating under whom there could be sub-supervisors, each in charge of a limited number of furnaces and all supervisors equipped with check sheets which would show daily, weekly or monthly the actual results obtained with each furnace.

As conservation methods in civilian housing and the



A NATURAL

VITROLINER
-the Superior Vent Pipe

TRADE MARK REGISTERED

A NATURAL combination of highest quality materials (Armco Iron and Vitreous Enamel) with patented engineering features make Vitroliner the natural answer to venting problems.

Vitroliner is a complete system of vent piping for gas, oil, or coal appliances. It consists of lengths of vitreous enamel coated steel pipe and fittings which are insulated with a high temperature prefabricated asbestos insulating wall. This system of outlet and vent piping can be installed inside of partitions or walls.

Vitroliner is being used extensively for low-cost housing projects. Vitroliner, with Fyrex insulation, eliminates the standard masonry chimney.

Write for further information.



VITROLINER
-the Superior Vent Pipe

Trade Mark Registered

**CONDENSATION
ENGINEERING
CORPORATION**

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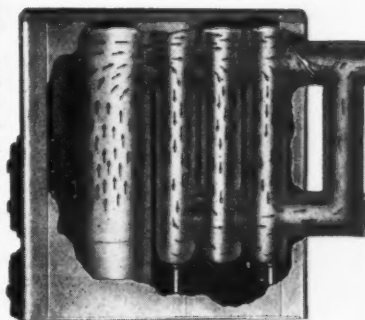
STACK TEMPERATURE *Down-SALES GO UP*

This patented Automatic Damper is the greatest sales feature in America's most active heating market — the warm air field. And only Leader dealers have this advantage.



HOT GASES TRAPPED

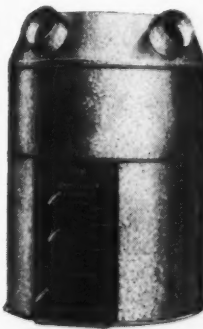
See how simply the KOOLSTACK principle works. Action of the Patented Automatic Damper prevents hot gases escaping up the chimney. Instead they are diverted through the economizer sections until every possible heat unit has been surrendered. An exclusive saving, selling advantage.



SELL ALL *THREE*

HAND FIRED STOKERS OIL BURNERS

THE Leader dealer meets the needs of EVERY customer, EVERY market. Because KOOLSTACK furnaces operate economically, satisfactorily, whether hand-fired, stoker-fired or oil-fired. Yes sir! There's real profit, real opportunity when you can sell ALL three. And that's exactly what the Leader dealer can do. Don't put off writing another minute. Get the money-making facts about your Leader opportunity now.

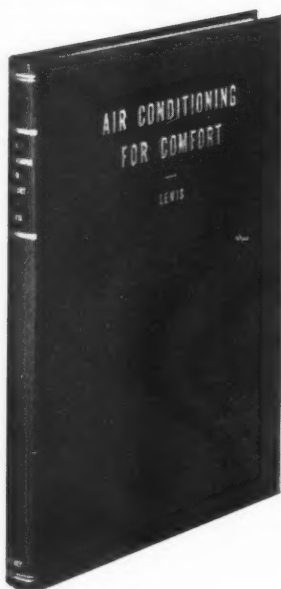


Leader KOOLSTACK furnaces available in BOTH cabinet and round-cased types. Gravity or forced air circulation optional. All welded construction. Capacities 50,000 to 200,000 B.T.U.'s.



LEADER IRON WORKS, INC.
DECATUR ILLINOIS
2841 NORTH JASPER ST.

KNOW AIR CONDITIONING



Send Today
for
Samuel R. Lewis'
**"AIR
CONDITIONING
FOR
COMFORT"**

Third Edition
288 Pages—Illustrated
\$2.00

Here is a book that presents—in simple, readily understandable form—every kind of information necessary for an accurate and thorough knowledge of air conditioning principles, equipment, and practices. Written by S. R. Lewis, a widely-known consulting engineer who has been active in air conditioning work for more than thirty years, it deals with all angles of the air conditioning subject from the practicing engineer's viewpoint. The designing procedures explained in the book are, for example, in every detail the same procedures employed today by the author's own organization.

Featuring this third edition are several entirely new chapters on phases of the subject not previously treated, including noise control, air conditioning measurements, air conditioning standards, fire protection codes and operating suggestions. Brand new designing examples are also used, together with new forms for recording the design data, the proper filling-in of which is explained step-by-step.

OF VALUE BOTH AS A REFERENCE AND TEXT

Engineers in air conditioning will find the new "Air Conditioning for Comfort" invaluable as a reference book, while salesmen, students, and others may rely on it to give them a clear knowledge of fundamentals, and of the latest air conditioning methods and equipment.

Send for a copy today. We know you will consider this volume the most readable and complete book on the air conditioning science you have yet seen. You will risk nothing in ordering a copy, for you will be privileged to return it for a refund if for any reason it should prove unsatisfactory. Order your copy now.

KEENEY PUBLISHING COMPANY
6 N. Michigan Ave. Chicago, Ill.

heating systems required therein, Prof. Konzo suggested these things:

- 1—Substitute materials to replace galvanized or black iron.
- 2—Manufacturers should obtain National Board of Fire Underwriters' approval on substitute material.
- 3—Union labor should be asked to agree to work with substitute materials.
- 4—Investigate the use of clips or fasteners for joining substitute materials.
- 5—Experiment with paint as a finish for black iron.
- 6—Building codes may need to be revised for the duration of the emergency.
- 7—Minimum duct sizes requiring a minimum amount of material.
- 8—Fewer returns, perhaps returns on inside walls.
- 9—The use of wood grilles.
- 10—The use of insulation, storm sash, etc., to reduce overall house heating losses, so that smaller furnaces, smaller ducts and less equipment can be used.

Kratz—Table I of the Manual

Prof. A. P. Kratz reported that Table I (Heat Loss Factors) from the Gravity Code Installation Manual has been set up to simplify heat loss calculations. Each type of common construction has been assigned a heat transmission coefficient. The table is arranged for temperature differences in ten-degree increments from 40 to 100. The resulting factor is the product of the temperature difference times the heat transmission coefficient. In some cases where this factor is not the product of the temperature difference times the heat

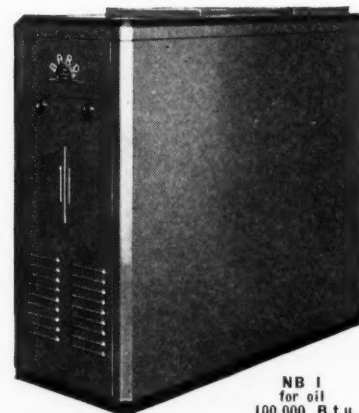
the **BARD LINE** of WINTER AIR CONDITIONING UNITS IS COMPLETE FOR **OIL** OR **GAS**!

The Right Unit at the Right Price for homes or commercial jobs.

From 80,000 to
400,000 B.t.u.

You can take "price" business at a profit, with Bard units . . . and be sure of satisfied customers. Bard owners are Bard dealer's best salesmen.

Write for dealer proposition.



NB 1
for oil
100,000 B.t.u.

BARD MANUFACTURING CO.
BRYAN — OHIO

transmission coefficient, it will be found, explained Prof. Kratz, that a combination temperature such as exists in the attic or the basement or a combination of materials has been taken into account and the factor can therefore be safely used. Multiplying the area by the factor gives the heat loss.

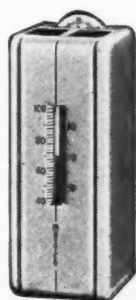
Indiana's One Day Convention

(Continued from page 77)

- 2—No double wall stacks or fittings.
 - 3—Use of wood grilles to replace steel grilles.
 - 4—No high sidewall registers where this location means more duct work.
 - 5—Gas or oil as a fuel may be completely out of the picture in some areas.
 - 6—Inside return locations in place of outside wall locations.
 - 7—Substitute materials for casings.
 - 8—Material and parts for maintenance or repair, but absolutely nothing for betterment or remodeling or replacement.
 - 9—Installations made as close coupled as possible to simplify duct work and reduce materials required.
 - 10—Substitute materials for fan housings.
 - 11—Three sizes of furnaces: up to 50,000 Btu; 50,000 to 65,000 Btu; 65,000 to 80,000 Btu.
 - 12—Use of space heaters or floor furnaces in certain areas for public housing construction.
- In connection with the three sizes of furnaces listed above, Mr. Frazee pointed out that government expects

RUGGED CONSTRUCTION SIMPLE OPERATION

Those are the features that assure the trouble-free operation and long life of this regulator. For you, this means freedom from service calls and a friendly feeling on the part of your customers . . . when you install the



MASTER HEAT REGULATOR TYPE P-23

This positive, snap action regulator operates on a differential of only $\frac{1}{2}$ degree. Accurate, dependable, low cost, it will outlast the heating plant itself. Operates quietly, surely, and safely—to the complete satisfaction of the most exacting user. Write us today for bulletin giving complete information on the Master line.

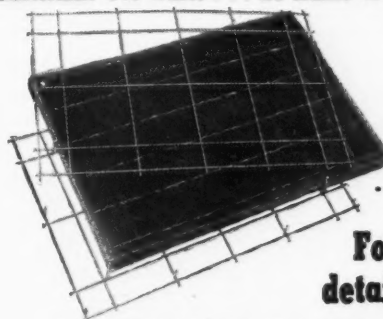
WHITE MFG. CO.

Makers of Dependable Regulators for 25 Years
2368 University Ave. ST. PAUL, MINN.

Here's How the New RiP-CLEAN Air Filter Triples Filter Life Increases Profits Stops Waste



RiP-Clean Air Filters last three times as long as ordinary filters . . . because clogged filters can be restored to service quickly and easily! When the filter is dirty, the top grid is unhooked and two layers are torn off (as shown above). This cuts down air restriction . . . makes filters last longer — but does NOT reduce dust-catching efficiency. This is the easy, profitable way to service air filter trouble. You get an extra sales point in selling Research RiP-CLEAN Air Filters. Research Air Filters contain a minimum of critical war-time materials. No waste . . . no frame to return.



No. 200 Series
Re-Fil-Able RiP-
CLEAN Air Filter

For full
details write

RESEARCH AIR FILTERS

RESEARCH PRODUCTS CORP.
MADISON, WISCONSIN

On the Firing Line

We on the "Industrial Front" have a job to do. We're on the firing line right here at home—our war production equipment, too, is vital to the successful conclusion of the war program.

Take precaution now, against bearing failures. Assure those who depend on you that your equipment will prove consistently free from bearing troubles by installing Randall Pillow Blocks. Randalls are self-aligning, self-lubricating, quiet, economical and durable. That's why over 1 3/4 million Randall Pillow Blocks have been installed on virtually every type of equipment.

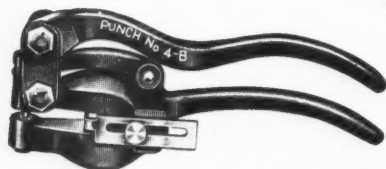
One Piece Steel
Housing Pillow Block



RANDALL GRAPHITE PRODUCTS CORP.

Dept. 211 609 W. Lake St. Chicago, Ill.

WHITNEY LEVER PUNCHES



**NUMBER
FOUR "B"
PUNCH**

This punch for sheet metal work has a capacity of 1/4" through 16 gauge. Weight 3 lb. Length 8 1/2". Depth of throat 2". Complete tool includes three punches and three dies of specified sizes with die adjusting key. A time-saver for your up-to-date shop.

And here's another handy tool for the modern shop—the No. 2 Punch. Length 23". Capacity 5/16" through 1/4" iron, weight 12 lbs., depth of throat 1-11/16". Punches and dies 3/32" to 1/2" by 1/64".



**NUMBER TWO
PUNCH**



WHITNEY MFG. CO.
636 RACE ST. ROCKFORD, ILL.

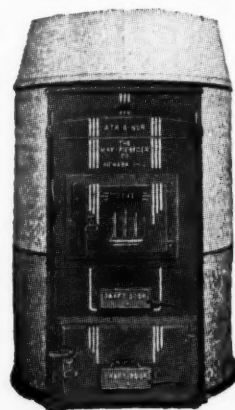
builders or owners to insulate their houses in order to keep the heat loss down to these three categories.

What Shops Are Doing

E. C. Carter, Snips Magazine, began his discussion of what dealers are doing around the country to meet present problems by emphasizing how fortunate the warm air heating industry is to have a man like Will McGrath as representative on the plumbing and heating advisory committee. Low-cost house heating is a problem which the industry must meet and Mr. Carter cited the case of the contractor who installed a pipeless furnace with one small warm air run to a critical room and one cold air return. The system was so installed that individual runs to individual rooms and additional cold airs may be made after the emergency is over. Substitute materials for panning return runs has almost become standard practice, said Mr. Carter, and we may expect more and more of this sort of thing as time goes on. Some contractors, pointed out Mr. Carter, are separating their furnace and sheet metal contracts on each house so that if there is any scarcity of material, one of the contracts can be completed without tying up both contracts. Contractors were advised to investigate the possibility of painting black iron if black iron continues plentiful and galvanized iron goes off the market.

What to do with stocks on hand is the problem and Mr. Carter cited the case of one contractor with approximately 4,000 pounds of stainless steel which the government will not permit him to use except on de-

50 YEARS OF LEADERSHIP *The Time-Tested* ATH-A-NOR



Furnaces, like any other piece of merchandise, are only as good as the people who make them. The May-Fiebeger Company has been making the ATH-A-NOR Furnace illustrated for over fifty years, and the fact that it will perform with unusual efficiency and economy is backed up by hundreds of satisfactory installations.

If you've been looking for a fast-moving, top performing gravity furnace to round out your line, investigate the ATH-A-NOR now! A postcard request will bring literature.

- QUALITY
- ECONOMY
- EFFICIENCY

... write today
for further information!

MANUFACTURERS OF QUALITY HEATING EQUIPMENT FOR OVER 50 YEARS

MAY-FIEBEGER COMPANY
NEWARK OHIO

fense orders. Copper now in stock can be used up to March 31.

1942 Michigan State College Short Course

G. A. Voorhees announced that in view of the present critical situation in the warm air heating industry and the need for information on how to heat small homes, the 1942 annual Short Course at Michigan State University, to be held the last week in March, will be devoted to discussion and engineering design of both gravity and forced warm air systems for small defense houses. Particular emphasis will be placed upon short-cut design and installation methods and on gravity as a means of heating small houses. More complete details of this course will be printed as soon as possible.

The convention ended in a round-table discussion of some problems such as the possibility of contractors in a given locality pooling their equipment, shop personnel, mechanics, etc., in order to obtain sub-contract work. Nothing definite was reached, but several contractors declared that possibilities seemed good and they intended to investigate the possibilities further.

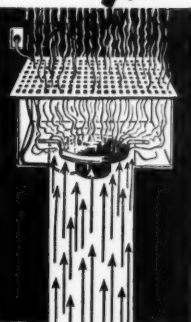
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COLD RUNS BANISHED!



This amazingly effective device not only boosts hot air into hard-to-heat rooms, it boosts profits into the pocket of the furnace man.

The Victor Booster needs only to be set in place, plugged into any electric outlet, and out pours a rich flow of hot air—not from an overfired furnace, but from an ordinary everyday fire. Two models, floor and wall. Liberal Discounts. Write today for detailed literature and prices.

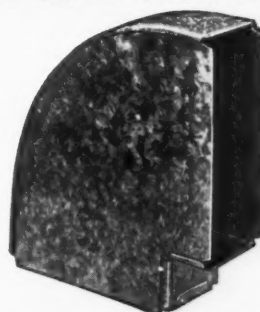
VICTOR ELECTRIC PRODUCTS, Inc.
Dept. HB-7 2950 Robertson Ave. Cincinnati, Ohio

ASK YOUR JOBBER OR WRITE DIRECT

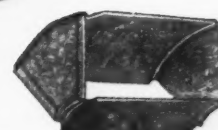
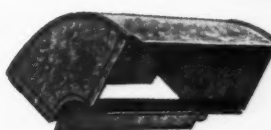
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PREFABRICATED DUCTS—FITTINGS for Forced Air and Air Conditioning Installations

24-hour
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Our
Engineers
Are At Your
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Our Catalog "A" (Gravity Fittings), Catalog "B" (Forced Air Fittings) are yours on request.

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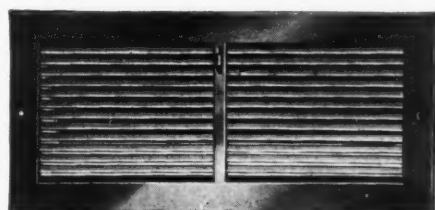
230 E. Front St.

Cincinnati, Ohio

NEW

AIR CONDITIONING REGISTERS

The New Rock Island line of Air Conditioning Registers now shown in complete new catalogue just off the press.



No. 822 Wall Register — Horizontal Vanes

The New Rock Island Air-Vane Registers are of bar type fabricated construction—Attractive Appearance—Rigid Construction—Vertical or Horizontal Vanes—Simple, secure adjustment.

Dealers Net Estimating Book, a time and money saver, gives full particulars, prices, etc.

Mail Coupon Today

ROCK ISLAND REGISTER CO.
Rock Island, Ill.

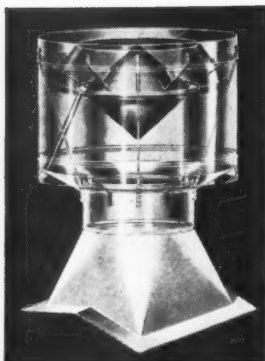
Gentlemen:

Please mail me a copy of your dealer's net estimating book.

Name

Street Address

City and State



Free-Flow Gravity

How to Specify the Right Roof Ventilator

Ask BURT

For any particular situation there usually is one certain type of roof ventilator which will serve best. Put your problem up to Burt Engineers. Let them advise with you and you will reach the correct solution. Burt makes a type and a size for every industrial, commercial and residential requirement scientifically designed, quality made and priced to give "more air per dollar."

THE BURT MFG. CO.

ROOF VENTILATORS • OIL FILTERS
EXHAUST HEADS

301 Main St., Akron, Ohio

SEND
FOR CATALOGS

Burt Engineers
are glad to
help on plans



SAL-MO Asbestos DUCTBOARD

For making Cold Air Return Ducts

SAVES TIME

SAVES METAL

A new asbestos product developed to do the same job usually done with metal.

SAL-MO Asbestos DUCTBOARD is fireproof, moisture-resistant, light in weight and durable.

Made in sheets 33" x 48"—1/8" in thickness—just the right width to cover 3 joists spaced at 16" centers, making 2 cold air return ducts.

Easily applied with hammer and nails or stapler. Samples on request.

SEE YOUR NEAREST JOBBER

SALL MOUNTAIN COMPANY

176 West Adams Street

Chicago, Illinois

Changes In Equipment Buying Procedure

(Continued from page 34)

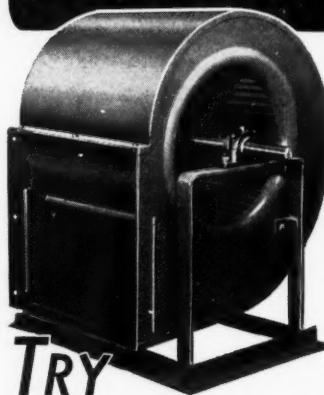
Priorities people in Washington suggest that there is no reason why the contractor with the A-10 rating, whose order can't be filled, should not shop around to find a supplier who has no higher or prior rating under which he must furnish the materials.

In the housing field the theory is that the service most urgently needed is the supply that should be rated highest. In other words, defense housing may be required in several places not far apart, but may be needed more urgently in one place than in another. Even if the ratings are identical, the theory at least is that the most urgent job should get the earliest supply. And if there is any conflict involving identical priority ratings, it is suggested that it is not difficult for the most urgent project to secure a readjustment placing the rating in a higher category. WPB now tries to function in a realistic manner, in a business-like way, to get the first thing needed done first. If you need a readjustment, go to your local official; if he is slow, take it up with Washington by telephone or wire. The people in Washington really want speed, and they will genuinely help to get speed. If there still is red tape, don't worry. Some red tape is inevitable.

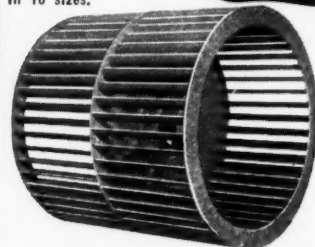
At the moment the War need for sheet metal is increasing. The word is that the priority rating applications are being processed in Mr. Timmis' section with speed and dispatch. But they do not come out of the higher realms with either speed or dispatch. They apparently are being held there because the relation of the actual inventories of sheet and plate metal to the demands upon the War Production Board is something like the demand upon a man with a pint measure who is expected to produce a gallon of contents.

Obviously, we not only must provide iron and steel for the supplies that probably are flowing across the Pacific,

We Use **CLARAGE**
FANS because Every
Wheel is **BOTH** Statically
and Dynamically Balanced



At left — complete fan for forced air heating or year-round conditioning. Very compact. Built in 10 sizes.



Or wheels only in any of 10 sizes to give any desired volume and pressure.

TRY

these QUIET-RUNNING UNITS

Standardize on Clarage — and protect your jobs against "fan troubles." Perfectly balanced wheels, improved bearings and slow operating speeds insure **QUIETNESS** — guarantee long service. Most widely used equipment in your field. Write for Bulletin 33 and see why!

CLARAGE FAN COMPANY, KALAMAZOO, MICH.
SALES ENGINEERING OFFICES IN ALL PRINCIPAL CITIES



COMPLETE
AIR CONDITIONING
•
COOLING
•
VENTILATION
•
FACTORY HEATING
•
MECHANICAL DRAFT
•
FANS and BLOWERS
for
INDUSTRIAL NEEDS

but we must furnish more supplies for our own internal War needs, and for the needs of our outposts spread around the world. Also, we must send iron and steel to the United Kingdom, to Africa, to Russia, and to South America. We must meet this demand for supplies if we wish to keep open the flow of saltpeter, rubber, copper, and other materials we absolutely require from the Americas to the South. Shipyards still are swallowing iron and steel in gargantuan gulps, and steel and iron is going into the special areas of our country for special needs.

There may be some hope that strip, which was 15% of the total steel product in 1941, will ease the situation for the sheet metal industries, with the automobile production shut down. In explanation, in December, 1941, 98% of the producing plants of the United States turned out 635,000 tons plates; 905,000 tons sheet, and 257,000 tons strip. Sheet and strip was almost twice the tonnage of plates. You also get the impression here that there may be some relaxation in sight because some hold the present enormous consumption has almost reached its peak, and that the driving pressure from all parts of the world may moderate, and we may reach a more stable equilibrium that will give us a little more margin for the not-so-essential needs of the civilian population served by the industries that work sheet metal. Strip may relieve some of the present pressure, and may come to the rescue of furnace makers and sheet metal workers in all divisions of the industry.

There is considerable confidence in Washington that much iron and steel scrap has been illegitimately hoarded. As a matter of fact, WPB has knowledge of the location of huge piles of scrap which have been seized and will be seized by the time this is published. Director James S. Knowlson, WPB Division of Industry Relations, has been empowered to requisition ANYTHING needed for the War. Government operatives have made a much more comprehensive survey of presumably hidden materials than hiders have any idea.

TRY US FOR QUICK DELIVERY

Sheet Metal Fabricating

MACHINES & TOOLS

Write for Catalog and New Bulletin No. 53

WARD MACHINERY CO.

564 W. Washington Boulevard
Chicago, Illinois



**REGISTERS • GRILLES
AIR CONTROL DEVICES
LOUVRES • VANES • SHUTTERS
DIFFUSERS • DAMPERS
DOOR VENTILATORS**

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WATERLOO, IOWA • SEATTLE, WASH.
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THESE ARE *Your Customers!*



YOU'LL SELL THEM FASTER WITH **HESS** QUALITY EQUIPMENT

Defense workers, bankers, salesmen—these are your customers—people who appreciate the precision craftsmanship of the HESS line of quality heating equipment. You'll profit by HESS' financing and territory plan.

DEALERS:
Write TODAY for New 1942 Portfolio!

IN 1942 FEATURE—
selling, modernizing, replacements and repairing with

- ★ HESS Blower Filter Units
- ★ HESS Welded Steel Furnaces
- ★ HESS Automatic Oil Burners
- ★ HESS Automatic Coal Stokers

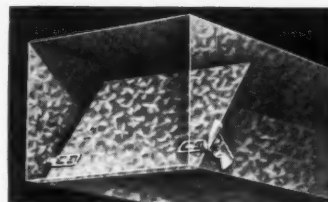
Quality Equipment from HESS
Costs Less!

HESS WARMING & VENTILATING CO.
1211 S. Western Avenue CHICAGO, ILLINOIS
Founded 1873

E-Z-ON

damper regulators...

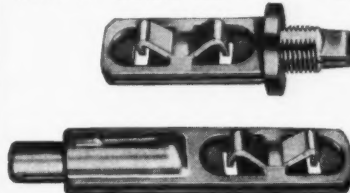
SAVE Installation Time and Cost!



Here's a DAMPER REGULATOR Set that you can install in a JIFFY! Just slip over the damper edge, drive prongs through the metal, and clinch them. Simple, quick, easy.

Contractors and Sheet Metal Men are saving real money with E-Z-ON Damper Regulators. They cost less, cut assembly time in half, require little experience to use, and provide a convenient, rattle-free installation.

Write for Bulletin and Prices on E-Z-ON Damper Regulators today!



E-Z-ON
"Snap-Tite"
Damper Regulator with Retractable Tail Piece.

★ Stocked by Jobbers EVERYWHERE ★

M. A. GERETT CORPORATION
2947 N. 30th Street Milwaukee, Wisconsin

THERMO-DRIP HUMIDIFIERS



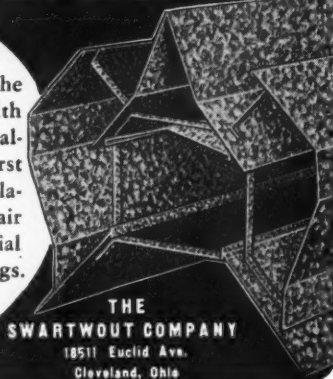
These floatless, drip-feed humidifiers prevent water from coming in contact with two or more metals simultaneously. That explains why THERMO-DRIP installations are singularly free from electrolysis!

AUTOMATIC HUMIDIFIER CO.
18th and Main Streets CEDAR FALLS, IOWA

Swartwout-Dexter HEAT VALVE

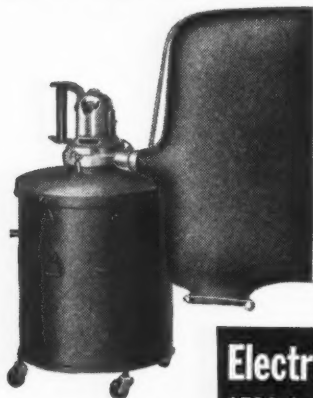
Boost your standing in the roof ventilating field with this dependable high quality Heat Valve—the first continuous type ventilator made. Economical air movement for industrial and commercial buildings.

Easy and profitable to install.



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SWARTWOUT COMPANY
18511 Euclid Ave.
Cleveland, Ohio

PREMIER FURNACE CLEANER



Keyed to
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Fast . . . efficient . . . saves fuel
. . . builds service business!
Write today for literature and complete information.

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¾ H.P. \$74.50 • 1 H.P. \$89.50
Complete chimney cleaning equipment only . . . \$10.00

Electric Vacuum Cleaner Co.
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Why QUIET-AIRE Blowers Stay Quiet!

Precision building keeps QUIET-AIRE Blowers quiet! Balanced statically and dynamically, with intake in scientific ratio to output capacity. 5 yr. guaranteed bearings and flexible motor mount eliminate adjustments, stop noise.

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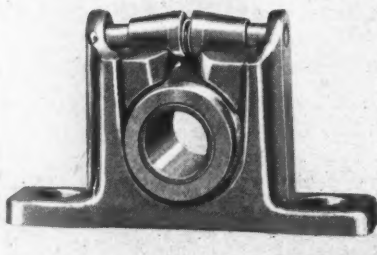
Furnace Manufacturers

QUIET-AIRE Blowers move more air—you use smaller sizes. Saves room.

★ **Jobbers and Dealers**

QUIET-AIRE performance—guaranteed greater capacity—and exclusive features build sales, let you MAKE and KEEP a profit. Write today for information.

MAPLE CITY STAMPING CO. - PEORIA, ILLINOIS



Light Lead Sheet On a Housing Project

(Continued from page 57)

A substantial number of homes in Strathmore are of half-timbered and stucco exterior design. Panels of the latter require preparation before applying the stucco and especially require flashing at top and bottom. Stuccoed areas are recessed 3 in. by the builder. Then the sheet metal con-



Ever Ready makes a practice of using a portable brake on the job enabling mechanics to measure, cut and fit from the flat sheet. Another popular type of bay window and stucco-timber gable in Strathmore.

tractor applies his lead flashing. Next, extruded metal lath is attached and, lastly the stucco filled in, usually with rough finish. Without the flashing weather tightness cannot be assured.

Discussing cleat formation and practice, the Ever Ready Roofing Co. uses 16-oz. copper and makes the cleat at least 1½ in. wide. Copper nails are placed in line parallel to the sheet edge to keep the cleat from turning. Cleat ends are, of course, turned back over nails to prevent the heads from cutting the sheet. Average spacing of cleats is 12 inches but frequently is 6 inches except wherever there are concealed valley flashings wherein the sheeting is held in place by roof covering. Under this condition cleat spacing is likely to be 2 feet on centers.



These light lead sheet bird houses are popular in Strathmore as ornamentation. Ever Ready now duplicate anything in lead formerly made in other materials.



**THE HOME FRONT IS
IMPORTANT, TOO!**

• Defense Installations of P. G. R. Heating Equipment.

From coast to coast—in camps, cantonments, barracks, training stations and defense homes—PACIFIC gas heating equipment does its bit in maintaining the high standard of health and comfort our service men deserve.

More than 29 years of specialized engineering experience in gas heating problems, plus one of the Nation's largest plants devoted exclusively to the manufacture of gas heating equipment—these are contributions for the "duration."

Whenever there is a need for health-building warmth and comfort—in camps or training stations, in factories, in defense homes—PACIFIC heating equipment is in the front line of service.



Pacific
GAS RADIATOR CO.
HUNTINGTON PARK, CALIFORNIA

59

PERFORATED METALS

Every Sheet Metal Worker needs perforated metal in one form or another.

For processing food products and to withstand certain chemicals, perforated Stainless Steel and Monel Metal are much used.

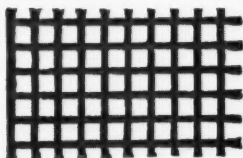
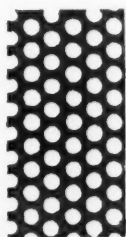
Factory Safety Guards—For this service perforated metal has no equal.

For Grilles, Radiator Enclosures, Air Conditioning Cabinets, we have many beautiful designs.

Write today for information and prices.

You'll like H&K prompt,
satisfying work and
pleasing prices.

Perforators of metals since 1883.
Send us your specifications.



The
Harrington & King
PERFORATING CO.

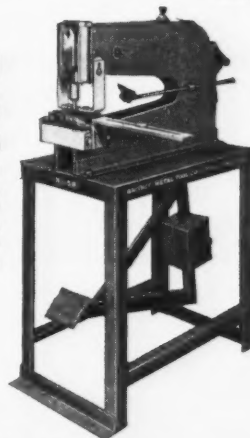
5649 Fillmore St., Chicago, Ill. New York Office, 114 Liberty St.

BUY WHITNEY-JENSEN
METAL-WORKING MACHINERY and HAND TOOLS
for LONG LIFE and ACCURACY

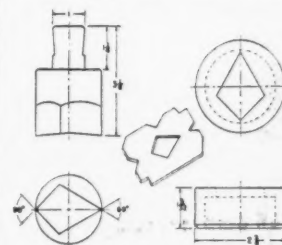
TOGGLE-ACTION FOOT PRESSES

7" 10" 18" 24" THROAT DEPTHS

Simple, sturdy construction, light weight with plenty of strength, lasting accuracy, low cost, and availability for prompt shipment—these features make Whitney-Jensen Foot Presses a stand-out value for light punching and forming operations. Capacity 2" hole in 16 ga. iron, 100 holes per minute or better.



DOUBLE-ANGLE PUNCH & DIE
Useful for a wide variety of notching and cornering operations. Whitney-Jensen offers a number of similarly handy special punch and die sets. Write for Catalog 14.



30 YEARS EXPERIENCE ||| OVER 80 USEFUL ITEMS
BUILDING SHEET METAL TOOLS ||| FOR SHEET METAL SHOPS

WHITNEY METAL TOOL COMPANY
91 FORBES STREET • ROCKFORD, ILLINOIS

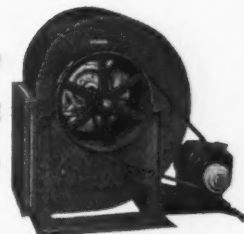
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Schwitzer-Cummins Company

• BLOWERS FOR EVERY PURPOSE

HY-DUTY Blowers, 9 3/4" to 25".
Top and Bottom Horizontal, and Top
and Bottom Vertical Discharge.
Top and Bottom Motor Mounting.
Dual Units also available.



• CENTER DISC WHEEL

Double Inlet, Double Width.
Reinforced Center Disc.
Designed for Modern Air Conditioning and
Heating Applications.
Sizes, 4 1/2" to 50".

• SINGLE INLET WHEELS

For Oil Burner, Stoker, and Air Conditioning
Applications.
Sizes, 4 1/2" to 50".
Variety of Blade Lengths for each diameter.



• ENGINEERING DATA

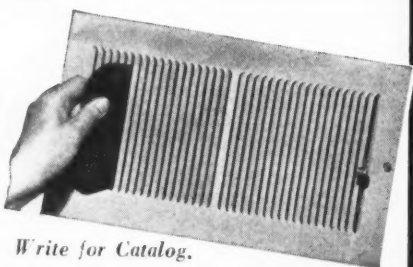
Write for Catalogues showing complete Performance Data.
Experienced Engineering Department available to help solve your
Air Handling Problems.

BLOWER DIVISION
SCHWITZER-CUMMINS COMPANY
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STANDARD "BEND-EZY" REGISTERS

INSURE SATISFACTION!

Everything you want in Registers! Easy installation, adjustable airflow, efficiency and durability. Reasonably priced ... ideal for low cost defense housing. Add "Bend-Ezy" Grilles for modern design.



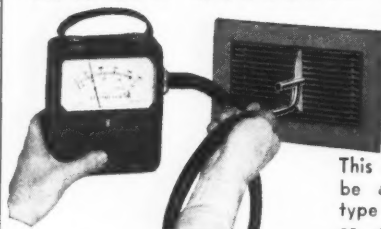
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STANDARD

3137 W. 49th PLACE

STAMPING & PERFORATING CO.
CHICAGO, ILLINOIS

NOW! ACCURATE AIR VELOCITY MEASUREMENTS at INTAKE GRILLES!



This new jet attachment can be added to existing Tube-type Velometers now in use, or can be purchased with

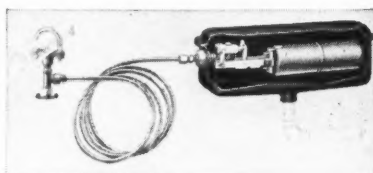
other standard jets and new Velometers.

The new intake grille jet is offered only in the spot type since the center reading only has proven to be sufficiently accurate for all commercial purposes. Write for information.

Illinois Testing Laboratories Inc.

412 N. La Salle St., Chicago, Ill.

The valve that MAKES HUMIDIFICATION UNFAILING



HERE'S a float valve that you can depend upon. Its patented "snap action" knows only two positions—wide-open or tight-closed. The wide-open flow prevents plugging and the tight closure prevents flooding. Use it where other valves have failed and see the difference!

MCDONNELL & MILLER
1318 Wrigley Building, Chicago, Ill.

The
MCDONNELL
Humidifier
Water Control

• BARBER

Gas Pressure REGULATORS

for Reliability!

Certified by A. G. A. Testing Laboratory. Write for Catalog and prices on Barber Conversion Burners, Appliance Burners, and Regulators.

THE BARBER GAS BURNER CO.
3702-4 Superior Avenue
CLEVELAND OHIO



Sizes 1/4" up

Ever Ready finds this new sheet lead readily acceptable to building owners. This, coupled with moderate cost, absence of streaking in service, ease in forming and laying make available a high grade material at a time when metal scarcity grows. Experience indicates that light lead can be far more than a substitute. According to the Ever Ready Roofing Co. its popularity should continue long after metals rationing has ceased to exist.

What Can the Heating Contractor Do?

(Continued from page 37)

lengthen life of firebowls.

d) If obtainable, install automatic controls to prevent overfiring and overheating of equipment. Abuse of equipment is a luxury no homeowner can afford.

4. Consider Adding the Installations of Storm Sash, Insulation, and Caulking to Your Line

a) Storm sash and insulation of new homes means that smaller sized equipment may be used.

b) Addition of storm sash and insulation to existing homes reduces fuel consumption and unloads the equipment so that it is not being pushed as much.

c) Install caulking around window frames,

SPOT WELD WITH AN ACME "Hot Spot" WELDER

Proven utility for over 26 years in thousands of sheet metal fabricating plants.

Write for Literature and Prices.

Complete Range of Sizes

Lifetime Guarantee!

ACME ELECTRIC WELDER CO.
2618B Fruitland Road Los Angeles, Calif.

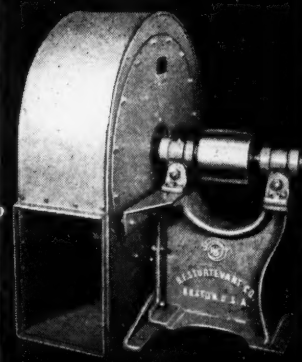


MILL EXHAUSTERS

1. Designed and built by the Pioneer exhaustor manufacturer.
2. Result of over 80 years of air engineering experience.
3. High efficiency assures low power consumption.
4. Sturdy construction assures dependable service.

Write for Catalog No. 430

B. F. STURTEVANT CO.
Hyde Park, Boston, Mass.
Branches in Principal Cities



around outside chimneys, and around the base plate.

d) Insist on insulation of floor joists on floors having unheated spaces below.

5. Do Your Part in This Present Effort

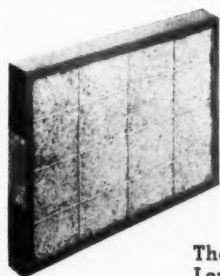
a) Keep adequate records of all work done. Know how many pieces of equipment go into direct defense construction, into buildings in defense areas, and in non-defense construction. Your supplier will need this information. Keep accurate records.

b) Go to your banks and loan agencies and tell them your ability to heat homes economically and efficiently. Tell them of the new 60,000 B.t.u. defense units now available that are in accordance with government defense housing standards.

c) Gather scrap iron and steel in your shops and in your installations.

d) Keep in touch with the activities of the N. W. A. H. & A. C. Ass'n. Mr. George Boedener is spending half his time in Washington keeping in touch with developments and offering assistance to any governmental agency that desires it.

e) Realign your practices to the new standardization program of industry. Study and use the new gravity manual and the Yardstick.



AXIOM AIR FILTER

The result of fifteen years experience
Lower in cost — Higher in quality
Huge dust capacity—low resistance
Prompt delivery assured
Order now

BLOCKSOM & COMPANY, MICHIGAN CITY, INDIANA



-BB- HOOKS & HANGERS

THRU
LEADING
JOBBER
EVERYWHERE



BERGER BROTHERS CO.

Main Office & Factory
229-237 Arch St., Philadelphia, Pa.

RYERSON CERTIFIED STEELS

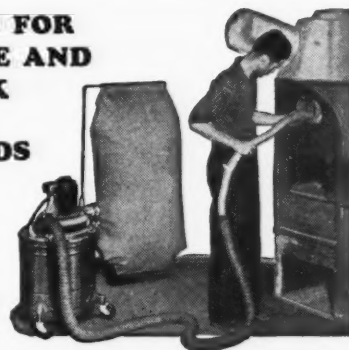
10 STRATEGICALLY-LOCATED PLANTS

Principal products include—Alloy Steels, Tool Steels, Stainless Steel, Hot Rolled Bars, Hoops and Bands, Beams and Heavy Structural, Channels, Angles, Tees and Zees, Plates, Sheets, Cold Finished Shafting and Screw Stock, Strip Steel, Flat Wire, Boiler Tubes, Mechanical Tubing, Rivets, Bolts, etc. Write for Stock List. Joseph T. Ryerson & Son, Inc. Plants at: Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City.

BE PREPARED FOR MAINTENANCE AND REPAIR WORK

with a
**GRAND RAPIDS
FURNACE
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DOYLE VACUUM CLEANER CO.
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Your work will proceed faster and neater when you use Bremil Portable Shears on the job or in the shop. Write today for literature showing complete line. Prompt shipment can be made from stock.

ALL-ALLOY No. 2 cuts up to 1/4" steel plate.

ALL-ALLOY No. 1 cuts up to No. 11 gauge strip or sheet.

Special blades may be obtained for shearing stainless steel.

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Repair parts

FOR ALL
HEATING UNITS

A. G. BRAUER SUPPLY CO.

Distributors of All Heating and
Air Conditioning Equipment

2100 Washington Ave. St. Louis, Mo.



PEERLESS FURNACES MEET ALL COMPETITION



The name **PEERLESS** on any furnace insures that it was made by a reliable manufacturer. **PEERLESS FOUNDRY COMPANY** has been a pioneer in warm air heating for over a third of a century. Write for dealer proposition.

REPAIR PARTS—**PEERLESS** manufactures and maintains a complete stock of repair parts for all makes of furnaces. Write for parts catalog.

PEERLESS FOUNDRY CO., 1853 Ludlow Ave., Indianapolis, Ind.

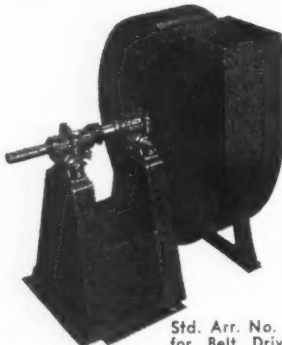
Repair for DEFENSE!

There's really no reason why you shouldn't run a profitable business even though you have a hard time getting **NEW** equipment to sell. The answer to consistent profits is **REPAIR WORK**. In many cases the repairs you make to furnaces, oil burners, stokers, etc., will leave the equipment with many serviceable years ahead of it. Repair for Defense is the watchword these days . . . and you can't find better repair parts than those we carry. Next time you need a repair part be sure you get it from our tremendous, guaranteed-to-fit supply.

Write for a catalog

NORTHWESTERN STOVE REPAIR CO.

Manufacturers of Stove, Furnace and Boiler Repairs
662 WEST ROOSEVELT ROAD CHICAGO, ILL.



Std. Arr. No. 1
for Belt Drive

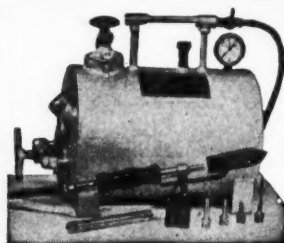
Write us about your problems. Send for Bulletin No. EX-41

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"EX" Fans are furnished in all standard arrangements of the N.A.F.M. The design is such that it can be easily modified to suit special assemblies, thus "EX" Fans are ideal for resale purposes, as part of factory assembled units.

REINER SOLDERING and BRAZING OUTFIT



Will Cut Soldering Costs in Half. No More Changing of Irons. A hot iron in one minute from cold start. Always the Right Amount of Heat for the lightest as well as the heaviest soldering jobs.



QUICK SET DIVIDERS

Now manufactured by Reiner & Campbell Co., Inc. Quick Set Dividers—fastest and most accurate on the market—two sizes for circles up to 36" and 48". Guaranteed—Order Now!

Ask for Catalog on Other New Sheet Metal Hand Tools.

REINER & CAMPBELL CO., Inc.
667 Norwood Terrace, Elizabeth, N. J.



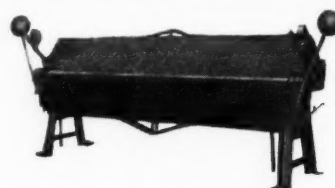
**Clean 'Em Hot--
No Shut Downs
On Coldest
Days.**

With your Red Streak Furnace Cleaner you render effective

first aid to soot-choked heating plants. All hot stuff trapped in the metal container. The powerful suction makes it easy—fast. Try your Super 5 days free, and learn why leaders in furnace service are Super equipped. Write for long terms.

THE NATIONAL SUPER SERVICE CO.
1944 N. 13th St. Toledo, Ohio

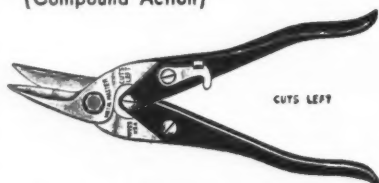
CHICAGO STEEL BRAKE



BEST BY FORTY-TWO YEARS TEST

DREIS & KRUMP MFG. CO.
7404 LOOMIS BLVD. CHICAGO

WISS "METAL-MASTER" SNIPS (Compound Action)



CUTS LEFT

"TWICE
THE WORK
WITH HALF
THE
EFFORT"

TWO MATCHED PATTERNS M1 (Cuts Left) M2 (Cuts Right) Cut circles, squares and any irregular patterns on Stainless, Dural and Monel Metals with the greatest of ease. Jaws of wear-resisting Manganese Molybdenum Steel. Handles hot-pressed from tough Chrome Vanadium Steel. Nickel steel bolts and nuts to Government specifications. All parts interchangeable. Detachable rubber handle grips at slight extra cost.

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ESTABLISHED 1848 NEWARK, N. J.

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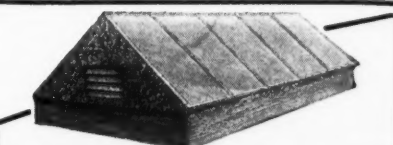
- What happens between two rooms, one having a six minute air change, and the adjoining room a twelve minute air change?
- Can you install a thermostat control system properly?

The answers to these and hundreds of other mechanical questions about air conditioning are appearing in the monthly **Air Conditioning Section of AMERICAN ARTISAN.**

If you do not now get the **ARTISAN**, send us \$2 and we will enter your subscription for a full year—12 consecutive issues. Your subscription will yield a rich harvest of money making ideas and solutions to many mechanical problems connected with warm air heating and sheet metal contracting.

AMERICAN ARTISAN
6 North Michigan Ave. Chicago, Ill.

AMERICAN ARTISAN Service Section



WILLIS DOUBLE PITCH SKYLIGHT with VENTILATOR

Another quality-built item quickly and easily assembled to make a complete job. Ventilator in gable end designed to open and close at will. Ventilator can be installed in ridge if desired. Constructed in any size desired. Write today for catalog.

Write for our Skylight Catalog No. 10

WILLIS STEEL CORPORATION
Galesburg, Illinois



Save Money, Time and Muscle

Drill Concrete with the "Do-All" Combination Electric Hammer and Drill. Set expansion bolts 10 to 20 times faster than with hand tools. Drills concrete, brick, stone, metal, wood. Easy to maintain. Weighs 15 lbs. "Drills to 1 1/2" in concrete. 2400 blows per min. Bulletin 400. Phone Austin 9866.

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4644 W. Huron St., Chicago, Ill.

Classified

MANUFACTURERS' AGENT

Manufacturers Agent seeks line of warm air heating equipment for central and southern Ohio. Annual sales in excess of \$100,000 per year. Here is your opportunity to secure adequate sales representation on the basis where every order gives a definite and specific profit, without investment on your part. Proven sales record and financially responsible. Address: Harry E. Hoagland, 199 N. Stanwood Road, Columbus, Ohio.

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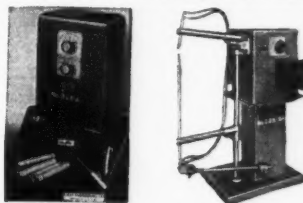
Furnace salesman with dealer contacts midwest, desires complete line moderate priced warm air furnaces, blowers, stokers, with manufacturer. Have good car. Highest references. Address Key No. 551, American Artisan, 6 N. Michigan Ave., Chicago, Ill.

FOR SALE

FOR SALE—Hardware store that has made money for the last 45 years on the same corner in Middle West City of 100,000. Will sell right—old age and poor health reason for selling. Also have a sheet metal shop employing 8 men. Address Key No. 550, American Artisan, 6 N. Michigan Ave., Chicago, Ill.

Galv., prime, sheets, 26 ga.; Forced air heads and elbows, Sq. and Rd. downspout pipe and elbows, U.S. forced air registers. Selling everything in our stock. Dresen Heating and Air Conditioning Co., 555 Forest Ave., River Forest, Ill., Tel. Forest 3188.

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Electric welding equipment of every description to weld from a watch case to a door. Special or standard SPOT WELDERS from 1/4 to 500 K.V.A. A.C. Arc Welders from 100 to 400 Amps. We invite contract Spot Welding in large or small quantities.

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CHAS. EISLER
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THOROUGHLY REBUILT, for perfect performance. All types; all standard makes. All sizes including the big ones. Hundreds in stock, meeting all requirements. Attractive prices. Fully guaranteed. Expert engineering counsel. **GENERAL BLOWER CO., Engineers, 403 North Peoria Street, Chicago, Illinois.**

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"Tops" for Air Washing, Humidifying, Brine Spray Lofts, etc. Marley nozzles lead all in sales and in profits to you.

★ Finer, more uniform spray.
★ Effective operation at Low Pressures saves on pumping cost.
★ No internal parts to clog or wear. ★ Longer life, superior materials and workmanship.

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MARLEY CO. Kansas City, Kansas

Trademark

YAGER'S Soldering Salts — Paste

Reg.

Two standard fluxes for all soft soldering. Safe, quick, certain. Buy them at your jobbers or write us if we cannot supply you.

1/2 lb., 1 lb., 5 lb. cans; 2 oz., 6 oz., 12 oz.

ALEX. R. BENSON CO., INC., HUDSON, N. Y.



ALLEN "ALL-SOL" STAINLESS STEEL SODERING FLUX

Here's a remarkable, fast flux that makes the soldering of stainless steel as easy as soldering tin plate. (Also available in a special odorless formula where less strength is required.) "ALL-SOL" works with all solders quickly, cheaply and efficiently. Send for free samples. Buy Allen Fluxes and Solders at your Jobbers.



L. B. ALLEN CO., Inc.
6702 Bryn Mawr Chicago, Ill.



ALLEN SODER- ING SALTS

An all around flux in convenient powder form; just add water 3 to 5 times according to metal to be soldered. Solders all metals but aluminum. Takes a quick bite and makes the solder hold on. Non acid. Comes packed in metal or glass as preferred. Send for FREE samples.

Buy ALLEN Fluxes and Solders at Your Jobbers



L. B. ALLEN CO., Inc.
6702 Bryn Mawr Chicago, Ill.

ALLEN EXTRA STRONG STAINLESS STEEL SODER



Allen Extra Strong Stainless Steel Soder gives joints of extra strength with great ease. The precise alloy needed for all-around soldering of stainless steel. Allen Extra Strong Stainless Steel Soder darkens slowly with age but does not lose its strength. Easily applied and conveniently carried in your kit. Send for free samples. Buy Allen Fluxes and Solders at your Jobbers.



L. B. ALLEN CO., Inc.
6702 Bryn Mawr Chicago, Ill.

QUICK DELIVERY FROM STOCK

BRAKES—CHICAGO STEEL

HAND: 4'16, 6'16, 6'14, 8'18, 8'16, 8'14, 10'16;

BOX & PAN: 4'14, 5'14, 7'14, 8'16;

POWER: 3'16, 4'14, 6'12, 8'10, 10'10, 10'16;

CRIMPERS & BEADERS

No. 0585 Pexto; Nla. Heavy Duty; Wheeler 22 ga.;

PRESSES—DEEP THROAT

No. 20 Excelsior; No. 135-A Niagara;

No. 15 Toledo; No. 12 Consolidated;

PRESSES—OBI

No. 1 Toledo, No. 1 1/2 V&O; Nos. 0 & 1 Rousselle;

No. 2 Walsh; No. 2 Rockford; No. 3 Niagara;

No. 4 V&O, 7" str.; No. 4 L&J;

No. 4 P Michigan; No. 5 Cons.

PUNCHES—SINGLE END

No. A-18 & No. 62 Beloit; Cleveland 60" thr.;

Kling 48" thr.; Nos. 5 1/2 & 2 Hillos & Jones;

Ryerson—capacity 1/2" thru 1 1/2";

ROLLS

HAND SLIP: 49"x3"; 36"x2" Pexto;

POWER: 38"x4" Bertsch; 32"x6" Robinson;

36"x4" Niagara; 38" 10 ga. Pexto;

10' 3/4" Columbus; 10' Wickes Vertical;

SHEARS

POWER: 12' 14 ga. Streine; 11'16 ga. Ohl; 10' 3/4"

Cin.; 8' 1/2" Toledo; 6'14 ga. Nla.; 5'16 ga. Nla.;

42"10 ga. Kutscheld; 36"14 ga. 36"18 ga. 30"18;

FOOT: 22" & 30" Pexto; 24" Hull; 30" Nla.; 42"

Kut.;

WELDERS

ARC: 150 amp; 175 amp; 200 amp; 350 amp; 400;

BUTT: 5 KVA; 10 KVA; 20 KW; 35 KVA; 40

KW; 45 KW; 75 KW; 100 KVA;

INTERSTATE MACHINERY CO., INC. — YARDS 5800
1433 W. PERSHING RD., CHICAGO, ILL.

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MODERN HEATING FOR LOW-COST HOMES!

New Airtemp Vapor-flame Oil Furnace Saves Vital Materials Gives Better Service *-Costs No More!*

DESIGNED FOR WAR NEEDS—Airtemp looked ahead, foresaw the growing shortage of metals, the coming need for a modern furnace engineered to weigh less and provide efficient heating while at the same time conserving fuel.

SAVES NEEDED METAL—Now that war has made the conservation of metal even more vital, while accelerating the construction of 600,000 low-cost homes for war workers, Airtemp's new, economical, long-lived, Vapor-flame furnace is ready! Tests in Chrysler Laboratories and in actual service have been exhaustive. Chrysler engineering and mass production have made available all the advantages of modern oil heat at a cost no greater than a hand-fired furnace! The new Airtemp Vapor-flame Furnace saves as much as $\frac{2}{3}$ of the weight of metal in the furnace it replaces!

A BETTER SERVICE—This modern furnace eliminates dirt and drudgery—for even when manually controlled, there are no fires to build—no coal to shovel—no ashes to carry. An inexpensive thermostat provides fully-automatic heat. For only a few dollars extra the gravity model can be equipped with a propeller fan for forced-air heating. Even complete winter air conditioning is provided by the model shown at the right—and at a cost which adds only \$3.00 a year to payments on a 20-year F.H.A. mortgage! Dealers will be performing an essential service in selling and installing the new Airtemp Vapor-flame Furnace. Mail the coupon now!

CHRYSLER
AIRTEMP DIVISION OF CHRYSLER



AIRTEMP
CORPORATION • DAYTON, OHIO



Designed for Defense Homes

Cutaway view of Model EO-8 Vapor-flame Winter Air Conditioner. Note filter; large, slow-speed centrifugal blower; Sure-Draft fan (on all models) which assures efficient combustion. Model EO-7 has propeller fan in base. Model EO-6 uses gravity air circulation.

**A Message to Heating
and Air-Conditioning Dealers from
D. W. Russell, Airtemp President**

"Airtemp builds products as necessary to the nation's war effort as they are to our civilian population. While our war production comes first, we will make every effort to apportion our remaining output of heating, air conditioning and refrigeration equipment fairly among Airtemp dealers—whose services are so vital to the public welfare. We are all doing an essential job in our industry—installation and service are as important as production."

D. W. Russell
President
Airtemp Division, Chrysler Corporation

CLIP AND MAIL THE COUPON TODAY! GET THE FACTS!

**AIRTEMP DIVISION, DEPT. AA-2
Chrysler Corporation, Dayton, Ohio**

GENTLEMEN:

Please send me more information about the low-cost Airtemp Vapor-flame furnace.

Name _____

Address _____

City _____ State _____

DECIDE NOW TO SAVE

★ TWO WAYS FOR OFFENSE!

★ *Fuel conservation is essential—*
and a White-Rodgers Night Set-Back system
in combination with other White-Rodgers
Heating Controls will assure maximum
fuel savings for every installation.

Separation of thermostat and timing
mechanism* plus the rapid response of
Hydraulic-Action Controls to temperature
change make these savings possible with
any type of fuel or heating system.

★ *You'll save man-hours too—* be-
cause White-Rodgers clearly calibrated
dials plus convenient knockouts and sim-
plified wiring and mounting facilities result
in neat, speedy installations. Time saved
can be profitably spent on new prospects.

Find out what White-Rodgers Controls can
do for your business by writing today for
your copy of the White-Rodgers Heating
Control Catalog.

*Heat of timing motor cannot affect accuracy of the thermostat.



TYPE 2402 (at left)
Time Switch with
slow-speed synchro-
nous motor. Sealed-
in lifetime lubri-
cation. Built for a
lifetime of trouble-
free service.

TYPE 134 (above)
Heat-Anticipating
Thermostat for
night set-back tem-
perature control.
Switch permits con-
tinuation of day
temperature be-
yond usual time,
when desired.



TYPE 519
Combination Fan and Limit Control for warm air service.
Incorporates two individual Hydraulic-Action Controls in a
single case. Two-speed fan controls also available.

WHITE ★ RODGERS ELECTRIC CO ★

12156 Cass Ave. ★ St. Louis, Mo.



2 (at left)
switch with
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air service.
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